The New Zealand Journal of Agriculture

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State of Tung-oil Plantations.

Analysis of Position in North Auckland.

DURING the past eight years ten companies have attempted to grow tung-oil trees on the plantation scale in various parts of the North Auckland Peninsula. The companies are—

Parengarenga Tung Oil ..	.. Te Paki.
Australian Plantations, Ltd.	.. Rangiputa.
Northern Tung Oil Co. ..	.. Lake Ohia.
*Parapara Development Co.	.. Parapara.
Tung Oil Securities ..	.. Matauri Bay.
Empire Tung Oil Co. ..	.. Waitangi.
N.Z. Tung Oil Corporation	.. Awarua, Kaukapakapa, Waipapa.
Tung Oil Plantations, Ltd.	.. Mamaranui.
Tung Acres	.. Te Arai.
Tung Oil Debenture Trust	.. Pukapuka.

* Private Company.

As nothing was really then known regarding the possibility of growing tung in New Zealand the undertaking was undoubtedly one of speculative character. Because of the conflicting nature of the claims made concerning the growth of the trees, investigations have been undertaken by the Departments of Agriculture and Scientific and Industrial Research. The position revealed is approximately as follows :—

(1) **Parengarenga Tung Oil,** Te Paki; **Australian Plantations' Ltd.,** Rangiputa; **Northern Tung Oil Co.,** Lake Ohia.

These plantations were a complete failure, and the controlling companies have ceased to operate.

(2) **Parapara Development Co.,** Parapara.

There are about ten acres of apparently satisfactory trees with an additional small area of very unsatisfactory and worthless trees.

(3) **Tung Oil Securities,** Matauri Bay.

	Acres.
Trees apparently satisfactory	0
Trees unsatisfactory	26
Trees very unsatisfactory	0
Trees dead and dying	314

(4) **Empire Tung Oil Co.,** Waitangi.

No map has been made of this property, but the whole of the area planted has been inspected, and the position is approximately 40 acres to 50 acres of unsatisfactory and very unsatisfactory trees, with a similar area of dead and dying trees.

(5) **N.Z. Tung Oil Corporation,** associated with **N.Z. Tung Oil, Ltd.,** and **Kaikohe Tung Groves, Ltd.**

(*a*) At Kaukapakapa most of the trees are dead, and the company has ceased operating here and transferred activities to Awarua.

(*b*) At Waipapa many trees are removed. The remainder are practically all dead. The company has ceased operating here, and has transferred operations to Awarua.

(*c*) Awarua :—

Block 1.

	Acres.
Trees apparently satisfactory	15
Trees unsatisfactory	244
Trees very unsatisfactory	106
Trees dead and dying	404

Block 2.

	Acres.
Trees apparently satisfactory	8
Trees unsatisfactory	192
Trees very unsatisfactory	190
Trees dead and dying	390

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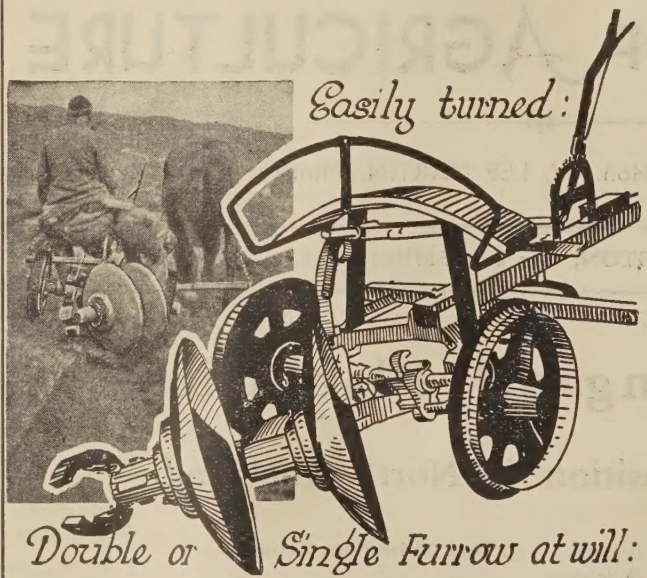

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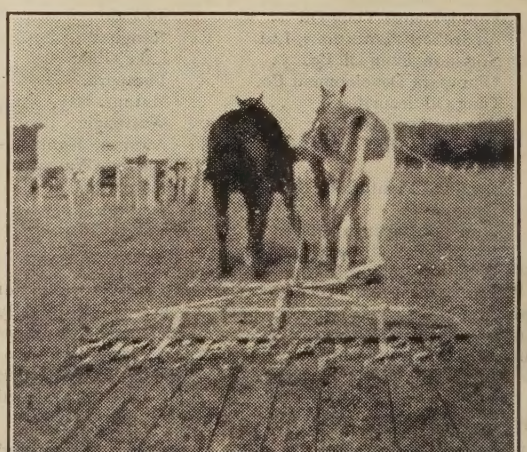

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Block 3.

	Acres.
Trees apparently satisfactory	14
Trees unsatisfactory	149
Trees very unsatisfactory	60
Trees dead and dying	401

These three blocks comprise the largest plantation in New Zealand, and a summary of the position to-day shows :—

	Acres.
Apparently satisfactory trees	37
Unsatisfactory trees	585
Worthless dead and dying trees	1,551

(6) **Tung Oil Plantations, Ltd.,** Mamaranui.

	Acres.
Trees apparently satisfactory	0
Trees unsatisfactory	52
Trees very unsatisfactory	14
Trees dead and dying	266

(7) **Tung Acres,** Te Arai.

The whole area has been inspected, but the maps prepared are not at present available. Approximately 500 acres have been planted, over which 90 per cent. of the trees are in a dead or dying condition and the remainder are quite unsatisfactory.

(8) **Tung Oil Debenture Trust,** Pukapuka.

	Acres.
Trees apparently satisfactory	7
Trees unsatisfactory	20
Trees very unsatisfactory	24
Trees dead and dying	201

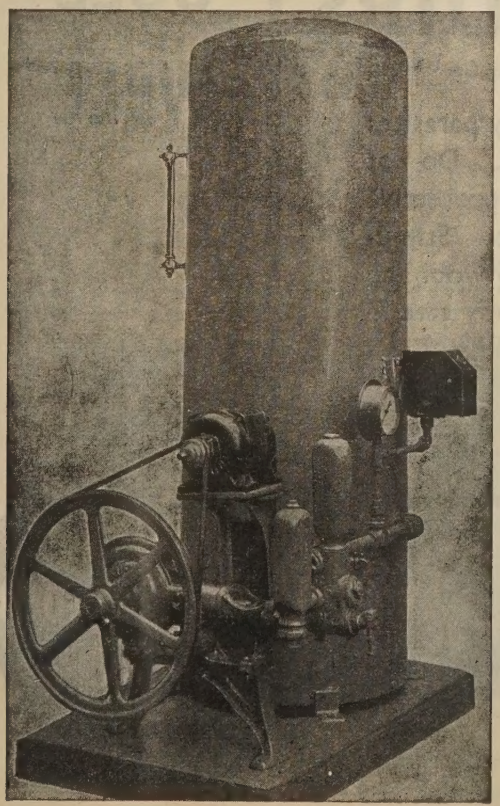
Summary.

To summarize, over the whole of the ten plantations the position is approximately :—

	Acres.
Apparently satisfactory trees	55
Unsatisfactory trees	733
Worthless dead and dying trees	3,760
	4,548

High Prices for Hay.

A SHORTAGE of hay in the Manawatu this winter resulted in very high prices. Two - year - old threshed rye and clover hay was sold at £4 10s. per ton. For some exceptionally good clover hay harvested from a contract white clover area at the end of November last an offer of £7 per ton was made, but the farmer would not sell it. He obtains good results from this hay for feeding of stud Romney hoggets. Both prices mentioned were for baled hay. Average baled hay sold at about £4 per ton.



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Importance of Dipping Sheep.

Lice-infested Animals are a Danger to the Sheep Industry.

T. H. HANKIN, Veterinarian, Whangarei.

BECAUSE of the nature of its fleece covering, the sheep is particularly liable to attack by skin parasites which are capable of producing disastrous effects, both in the wool itself and on the general nutrition of the animal. The most serious of these parasites is the mange-mite, which gives rise to the dread disease "scab." When rampant in a country this causes enormous economic losses.

By systematic dipping this particular disease has been eradicated from New Zealand flocks, but several other parasites are still present which, if left uncontrolled, would soon lead to material damage in the sheep industry, and it is with the view of keeping vermin in check that the sections of the Stock Act quoted below are enforced :—

Section 47 of the Stock Act, 1908, reads as follows :—

"(1) Every owner of longwool or cross-bred sheep shall, during the period hereinafter mentioned in every year, dip or cause to be dipped all such sheep of which he is the owner.

"(2) The said period shall be as follows :—

"(*a*) In the North Island, between the first day of January and thirty-first day of March; and

Material damage to the sheep industry would soon result if certain skin parasites were left uncontrolled, and comprehensive directions for dipping are explained in this article. It is emphasized that the dipping-materials should be mixed according to the manufacturer's directions, that suitable weather should be chosen for the operations, and that precautions should be taken that the stock are not poisoned by consuming material contaminated by the dip.

"(*b*) Elsewhere than in the North Island, between the first day of January and the thirtieth day of April.

"Provided that on the application of such owner any Inspector, if satisfied that owing to want of water or other sufficient cause the dipping cannot be done within the period applicable as aforesaid to such owner, may, by writing under his hand, grant an extension of time for any period not exceeding thirty-one days."

However, while farmers obey the letter of the law regarding the dipping of sheep, many, unfortunately, do not carry out the operation effectively, with the result that we still find lousy and "tick" infested sheep which are a positive danger to the country. Experienced sheep-farmers know the importance of keeping their flocks free of skin parasites, but with the larger number of small flocks coming into existence a few notes on the dipping of sheep may be of interest to readers of the *Journal*.

Chief Skin Parasites.

The chief skin parasites affecting sheep in New Zealand at present are the sheep "tick," or Ked, and lice, although the blowfly maggot occasionally causes severe damage in some districts under certain conditions. A brief outline of the life-history of these pests will indicate the importance of carrying out dipping operations thoroughly.

The sheep "tick," or Ked, is not to be confused with the cattle "tick" found in parts of the Auckland Province, and, as a matter of fact, it is not really a true "tick." The term "sheep tick" is so universally used, however, that we will retain the name here for the sake of clarity.

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Ticks live by sucking blood from their hosts, and to prevent coagulation of the blood they inject a substance into the bite which produces intense irritation. The female is not particularly prolific, and lays from three to five eggs, each at intervals of a few days. The eggs are brown, oval bodies about the size of a grain of rice and are attached to the wool by a sticky material. About three weeks after being deposited these eggs break open and a young tick emerges.

Tick Population Increases.

The cycle is repeated, and ultimately the tick population on a sheep is so great that the animal ceases to thrive and the wool becomes stained, thus detracting from its value. Ticks attack lambs very severely and, if at all numerous, prevent them from thriving as they should.

There is no difficulty in finding ticks on infested sheep, but lice, being much smaller—although present in large numbers—are often not observed by the farmer, even when his sheep are heavily infested by them. They are a dull, white colour, the head and thorax being reddish, with bands of red on the abdomen. Hence, body lice are difficult to see in the wool, but if sheep are observed to be constantly rubbing and biting themselves a careful search should be made for lice, especially in the brisket and neck regions. A hand-lense is useful if one's eyesight is not of the keenest.

Lice are particularly active, and migrate readily from sheep to sheep, giving rise to intense skin irritation which soon leads to loss of condition and ruination of the fleece. Hence their presence in a flock is looked upon as a serious menace. They multiply very rapidly by laying eggs or "nits," which hatch out within fourteen days.

The Leg Louse.

A much more conspicuous parasite is the leg louse, which is generally confined to the hairy parts of the legs. It lays a large number of eggs which remain attached to the hair, giving the affected limbs a distinct brown appearance. Only individual sheep are affected, but they should be isolated and treated, as clean sheep may become infested by contact. As will be explained later, more than one dipping may be necessary to eradicate the parasite.

Neither Keds nor lice live long apart from their hosts. The chief method by which clean sheep become infected is by coming in contact with vermin-infested animals. Camping-grounds, mustering operations, saleyards, &c., are avenues of infection. Another medium of spreading is from weak sheep left behind by drovers, these animals often being lousy or tick-infested.

Spreading Infections.

It is obvious, therefore, that a few animals infested with parasites are capable of gradually infecting a flock. To prevent this it is very important that no stragglers be left behind at mustering, as these animals are likely to be carrying large numbers of lice and ticks, thus remaining as reservoirs of infection.

Blowflies normally deposit their eggs and maggots in carrion, &c., but sheep's

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wool, especially when soiled by urine and fæces, has a particular attraction for them. The larvæ actually eat into the flesh of the "struck" animals, and it is easy to imagine the damage caused.

Dipping Mixtures.

Sheep-farmers have long recognized the necessity of controlling these parasites, and various substances have been used from time to time for making dipping with this object in view. Tobacco extracts, sulphur and lime, coal-tar preparations, arsenic, derris root, &c., have all been employed. Proprietary firms have evolved various formulæ combining arsenic with other materials, so that the modern dip has been brought to a high state of perfection if used strictly in accordance with the maker's directions. The so-called non-poisonous dips, which are generally based on coal-tar derivations, also have their uses, such as when it is necessary to dip sheep immediately after shearing.

If ewes and lambs are badly affected with ticks at this period it is advisable to dip them in a non-poisonous dip immediately the ewes are shorn, as the ticks migrate from the newly-shorn ewes to the lambs, greatly to the detriment of the latter. In flocks where lymphadenitis is prevalent it is also sound practice to dip sheep off the shears to prevent the entrance of the Preisz-Nocard bacillus through shear cuts. In these two instances arsenical dips are to be avoided, as there is a risk of arsenic being absorbed through wounds, leading to poisoning.

Two Factors.

From what has been said regarding ticks and lice it is evident that two factors have to be considered to keep sheep clean—(1) destruction of the mature parasites, (2) destruction of the eggs. The first proposition is relatively easy, and in the case of the tick the "eggs" are fairly readily destroyed, but where lice are concerned the "nits" are very resistant. It is advisable to dip sheep twice at intervals of two to three weeks when they are lice-infested.

The first dipping destroys the mature parasites, and the second eliminates lice derived from "nits" that have hatched out in the interval before the young lice have had time to deposit any fresh eggs. Provided dipping is done as it should be, the flock will thus be rid of the skin parasites, benefiting both the sheep and their owners, but if the dipping is performed in a perfunctory manner satisfactory results cannot be hoped for.

The first essential is to be sure that the dip is properly prepared, and the second is to see that the sheep are thoroughly saturated with the fluid. Lice especially live close to the skin, and unless the fleece is soaked through and through many of them will escape destruction. The capacity of a dip should be known, and it is easy to calibrate the bath by pouring in known volumes of water and putting marks on the side of the dip indicating its capacity at various levels, or a dip stick may be marked in a similar fashion.

Thorough Mixing of Materials.

A thorough mixing of the dipping-materials is essential, and the fluid in the dip should be agitated from the bottom frequently during dipping operations so that materials used to fix the chemicals in the fleece will be taken up by the individual sheep and the fluid kept at uniform strength. When adding fresh dipping-material to keep the dip sufficiently full be sure to mix it well.

The most suitable time to dip sheep is about two months after shearing. Shear cuts have then healed and the wool has grown sufficiently dense to take up the dip, so that, after the sheep have dried, there is enough arsenic left in the fleece to prevent reinfection for a considerable period. The arsenic present also assists in destroying blowfly larvæ.

Soft water, such as rain-water is desirable for use in dipping, as it enables the fluid to penetrate the fleece better. If such water is not available other water may be softened by adding 2 lb. to 5 lb. of washing-soda to 100 gallons.

If dipping is carried out with reasonable care losses are negligible, but occasionally untoward results do arise when instructions are not obeyed to the letter. It must be remembered that, in general, dips are deadly poisonous and more or less irritant to the skin. When sheep are overheated either by close packing, rapid driving, or even due to a hot sun, the skin is congested and, if immersed in a bath, is likely to develop scald, which in turn allows some absorption of arsenic. A similar result may be brought about by sheep remaining wet and closely packed together.

Sheep should be yarded overnight and have access to water, as thirsty sheep might drink some of the dip, with disastrous results. A fine, good drying day should be chosen for dipping operations, and no sheep should be dipped later in the afternoon than will allow of it drying before nightfall, as there is always a possibility of pneumonia developing if the animals become chilled. On sheep-stations the dip is so arranged that the sheep are held in a draining-pen, allowing excess fluid from their fleeces to run back into the dip, but with smaller flocks this may not obtain.

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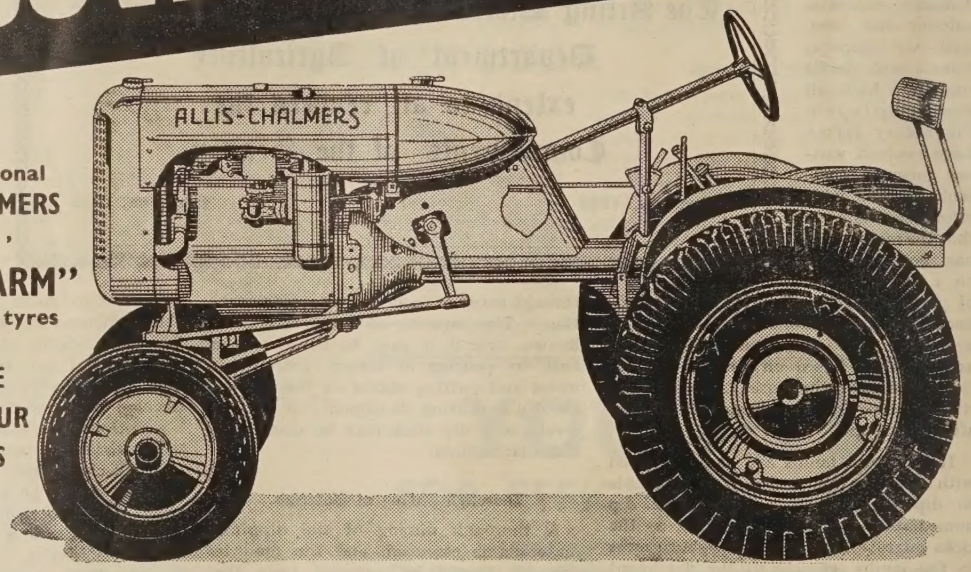

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Word of Precaution.

A word of precaution here: Do not allow wet sheep into places where grass is growing, as the poisonous dip will contaminate the herbage, which may be eaten by the hungry sheep. For efficient dipping, all parts of the fleece should be saturated right down to the skin, so that sheep must not be hurried through the dip. Their heads should be immersed twice, with an interval between each immersion in order that the animal may take a breath. This operation should not be done suddenly, as there is a possibility of the sheep breathing fluid into its lungs if it should happen to be taking an inspiration at the time its head disappears under the fluid, fatal pneumonia being the result. This applies particularly to lambs which have had no previous experience of a passage through a dip.

Rams are notoriously poor swimmers, and special care is necessary in dipping them. They should be put in one at a time, and if necessary, assisted through the dip by holding the head up, immersing it gently just before their exit from the bath. As the tupping season approaches the scrotum and adjacent parts become congested, and they are particularly liable to damage from arsenic at this period, leading to extensive scalding and even permanent damage to the testicles. Therefore, dip your rams early in the season, and do not allow them to run with recently-dipped ewes.

The dip should be kept reasonably clean, as organic matter affects the solubility of arsenic, and dirty sheep should be dagged. Material from the previous season should not be left in the dip for use the following season. It has been found occasionally that harmful germs, such as malignant œdema, have been present in such residues, leading to infection and loss of sheep passed through later on.

In emptying dips, remember the poisonous nature of the contents, and do not allow the places where stock are likely to have access to be polluted.

Summary.

To sum up briefly:—

(1) Pay particular attention to thorough mixing of dipping-materials according to manufacturer's directions.

(2) Choose suitable weather for dipping operations, and do not dip the sheep when they are overheated.

(3) Make sure that the sheep remain in the dip long enough for the fleece to become thoroughly saturated.

(4) Dip twice at two- to three-week intervals if the sheep are affected with lice.

(5) Take reasonable precautions that the stock are not poisoned by drinking or eating material contaminated by the contents of the dip.

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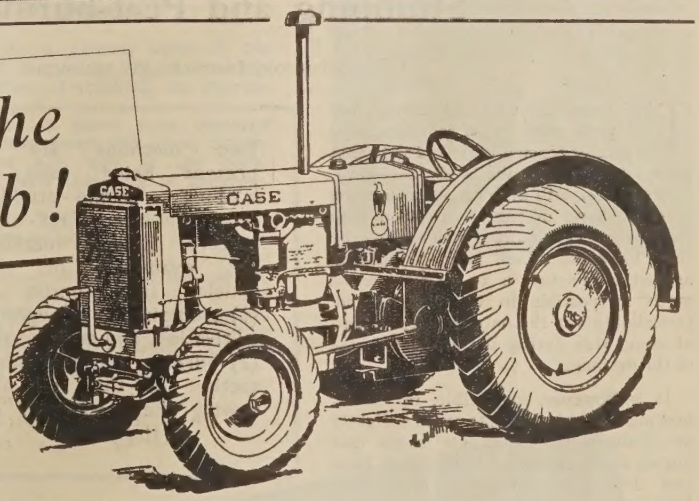

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Fig 1.—A general view of an area which has been burnt and then sown. Note the larger stumps still present.

The Grassing of Peat Swamps.

Stumping and Peat-burning Methods.

G. S. ROBINSON, Instructor in Agriculture, Palmerston North.

THE breaking-in of peat swamps has always been a task requiring very careful consideration. In the first place, drainage is absolutely necessary, but, together with drainage, consolidation must go hand in hand. Drained peat swamps are generally characterized by their looseness, which must be guarded against if moisture is to be retained as much as possible in the surface soil. Consolidation is the only feasible method of doing this during the gradual course of the drainage.

It is, however, impossible, no matter how much care is taken, to avoid a slightly overdrained state, and this means that during much of the year the soil is loose and dry. In certain circumstances, farmers have found it advisable in grassing peaty soils to burn the peat to a definite level and to avoid the over-drained state by bringing the surface nearer the water-table.

The Pasture Carried.

In the raw state the stump-studded country is used for rough cattle-grazing, and carries a pasture of which the main constituent is tall fescue. The soil consists of a loose, organic section of peat of 12 in. to 30 in. in depth overlying river silt of good water-holding capacity and of high fertility. It is not, therefore, an area of deep peat.

Two methods are at present being used to bring stump-studded country into first-class pasture. These methods are examined in this article, and consist of (1) stumping, ploughing, cultivation, and sowing, and (2) burning off the peaty section of the soil and sowing the grass-seed on the ash.

Two methods are at present being used in an attempt to bring this into first-class pasture. The first method consists in stumping, ploughing, cultivation, and sowing down, which averages out at a cost of from £20 to £25 an acre. Consolidation is the main requirement in obtaining a good strike of grasses and clovers, and the rolling of the cultivated land six or seven times with a heavy roller as illustrated in Fig. 2 is essential. Even then, the soil is loose and pasture establishment is difficult.

In Fig. 3 the establishment of rye-grass and white clover sown in March, 1938, has not been good, even though every effort was made to secure adequate consolidation, and the pasture has carried very little stock during the winter. Costs would prohibit a farmer breaking in a large area of his farm in this way.

Another Method.

Another method is being practised—namely, that of burning off the peaty section of the soil and sowing the grass-seed on the ash. A trench is made around the area to be burnt in order to confine the burn. This necessitates going down about 15 in. to 30 in. to the silty layer. In Fig. 5 this trench is illustrated after the area was burnt.

This method is much cheaper, but because the stumps are left it can be regarded as a more temporary method of breaking in the swamp. The only costs are those of the seed and of the clearing-away of the smaller stumps, which, on the average, amounts to about £5 or £6 per acre, but depends on the extent of stumping. Consolidation of the ash is obtained by dragging four railway-irons, bolted together in the form of a square, over the ash.

Figure 7 illustrates an area sown on burnt country within a few days of the sowing of the pasture in Fig. 3. The former mixture contained more temporary rye-grass, which would naturally give greater growth in the early stages, but,

(Continued on page 484.)

The Grassing of Peat Swamps.

Fig. 2.—The type of heavy roller used to assist in the consolidation of the ploughed land.

Fig. 3.—A close-up of the pasture sown on an area that has been stumped and ploughed.

Fig. 4.—A general view of the paddock shown in Fig. 3, showing the method of stacking the stumps.

Fig. 5.—A burnt area, showing in the foreground the loose, unconsolidated ash, and in the background light stumping in progress.

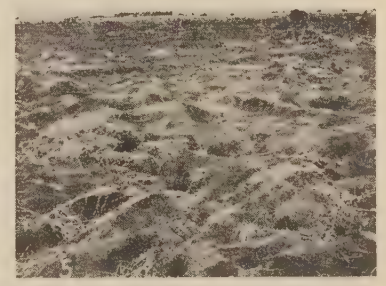
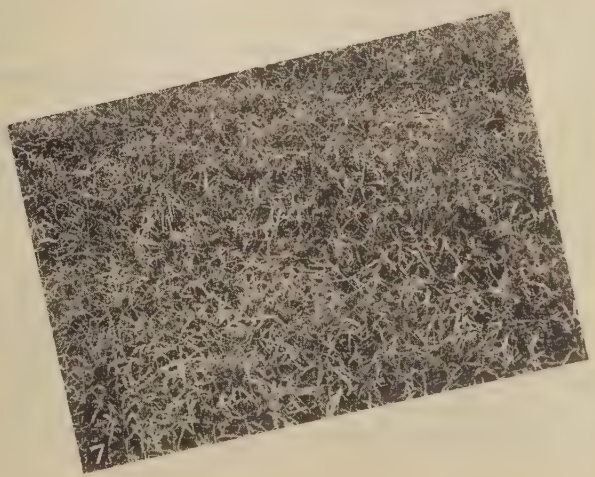


Fig. 6.—The trench dug near the fence-line to control the burn.

Fig. 7.—A close-up of the pasture sown on 14th March, 1938, on the ash of burnt peat. The photograph was taken on 5th August, 1938, two weeks after being grazed by 270 wethers for three weeks.



Extermination of Willows.

Ring-barking and Poisoning Methods.

WM. C. HYDE, Horticulturist, Wellington.

In an inquiry to the *Journal*, R.S.B. (Bay of Islands) writes: "We in this district view with alarm the rapid increase in willow-trees along the main creeks (usually called rivers), and we shall have to exterminate them by some means. There are various opinions as to the proper time for ringing, and some also maintain that in order to speed up the death of the tree it is necessary to strip the bark from the ring down to the roots. When I tell you that during the last twenty years the bed of one river has silted up at least 4 ft. simply through the increase of willow-trees you will readily understand that we have need of drastic measures."

Concern at the rapid increase in willow-trees along the main creeks is expressed by a correspondent, who asks for the best method of exterminating them. The following article deals fully with the subject and makes suggestions for accomplishing this object.

IN soil which is always moist—and especially beside fresh-water rivers and lakes—the willow, or sallow, is commonly found in most countries. In the Arctic regions it is but a prostrate shrub, but it makes a good bid among hardwood plants for the record for endurance in that climate. Mostly deciduous, and consisting of some three hundred species and many hybrids, the willows are dioecious—that is, the flowers are not only separately staminate and pistillate, but they are on separate trees. The seeds are short-lived, but the branches are brittle, and pieces becoming imbedded in mud or wet soil readily establish themselves.

The willows are invaluable for binding embankments, and they provide quick shade and shelter for stock and crops. Also, the fine, tough, white wood is useful for many purposes. It makes the best charcoal, and because of its light weight and tough character it is preferred for bottoms of drays and barrows. It makes good flooring, and has been used in the construction of fast sailing-ships. The withies or osiers are used for basketware, and in some countries they are still used as ties in the garden and orchard.

The wood is, of course, unexcelled for the making of cricket-bats, and the foliage and twigs are popular with browsing animals. The bark has even been dried, ground, and mixed with oatmeal for the consumption by people in times of scarcity. Salicin is a bitter glucoside found in the bark which has many uses, including medicinal. Many species are ornamental, especially those with a "weeping" habit, coloured bark, or showy catkins.

Aggressive Character.

With all of these useful and ornamental qualities these trees have an aggressive character which, while placing them readily at man's disposal, sometimes makes them troublesome. Along the banks of rivers they form a stable margin, but where the rivers are shallow branches broken off in a high wind soon ground and grow. If this is allowed to continue unchecked in any part of a river-bed, serious obstruction soon arises; the bed silts up, and the river has to find another channel.

To prevent this taking place obstructive trees should be grubbed and hauled out with a winch, grubber, or other gear. If this is not possible or convenient the trees may be killed and burnt. Most trees may be killed by ring-barking, but in the case of willows, and others which have a strong suckering habit, something more is required. To prevent suckers growing from the stump below the ringing it is customary to poison the tree. Further, if this is to be effective it should be done at the right season, which is just as the tree is passing into a dormant stage.

The quickest way to ring the tree is to "frill" it by a succession of downward cuts with a sharp axe, cutting well through the bark and each cut overlapping the next, so that no portion of the bark is left to enable the sap to flow across. This operation should also be carried out as close down on to the crown of the root as possible. A strong solution of any good weed-killer in an old kettle or other vessel with a spout which will enable it to be poured economically should then be poured into the cuts to wet the surfaces thoroughly.

Solution for Poisoning.

A solution very commonly used is arsenite of soda, made by boiling white arsenic in soda water for half an hour or so until it is dissolved. One pound each of arsenic and washing-soda and 4 gallons of water make a strong solution for this purpose.

Take 1 gallon or 2 gallons of water, dissolve the washing-soda, stir in the arsenic which has previously been made into a paste, and place it on a good fire. After boiling for half an hour and the arsenic is dissolved make up the solution to 4 gallons, and it is ready for use. Care should be taken to avoid breathing the fumes from this mixture, as they will cause sickness. A method which is claimed to be easier and quite satisfactory is to place 1 lb. of arsenic and a ½ lb. of caustic soda in a bucket, mix well in a dry state, add water slowly, stir well until the arsenic is dissolved, and then make it up to 4 gallons.

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THE GRASSING OF PEAT SWAMPS.

(Continued from page 482.)

nevertheless, as the photos show, there is no comparison between the two. In July this area of 17 acres carried 270 wethers for three weeks, the sheep showing remarkable improvement while on the young grass.

Less Expensive.

This method, in addition to being less expensive in bringing the farm into first-class pastures, appears to have advantages lasting several years at least.

Frequently, where grass is sown on the peat, rye-grass gradually goes out, giving place to weeds and poorer species, including tall fescue. After several years, too, the land settles in parts and becomes very rough. The pastures on burnt areas grow excellent white clover, especially in the first year or two, tending, in fact, to choke out the rye-grass where careful grazing management is not practised.

The country mentioned in this article, when stumped and ploughed but not burnt, is excellent cropping country, exceptional crops of potatoes and onions being grown. Thus, the burning of the whole farm would not be advisable. Certain areas could be kept with profit with a view to using them for cropping.

❖ ❖ ❖

The Pig Club Movement.

Suggestions for Consolidation of Work.

C. H. M. Sorensen, Taranaki District Supervisor.

Four years' work of the pig-club movement in Taranaki is reviewed by the District Supervisor, who comments on the weaknesses of the present system of operation, and discusses suggestions for the consolidation and co-ordination of the work.

AFTER four years of club work it is interesting to review the whole position, to note the weakness of our present system of operation, and to suggest what, in my opinion, would consolidate and co-ordinate our work on behalf of producers.

Finance.

The financial aspect of our present system has not been too satisfactory. Where the club sow has produced a majority of sow pigs of good quality the position has been quite good, but where boars have predominated the reverse is the case. It costs about £30 to start a club on sound lines—that is, a good pedigree in-farrow sow and a house and yard. Where the custodian provides the house and yard £15 to £20 should be sufficient, but the point must never be forgotten that the custodian's farm must not only be a place to breed pigs, but it must definitely be an object lesson in layout and management. If this fact is lost sight of we have only half done our job.

The £1 asked for has been a convenient figure and one that has met favour with farmers, but it has sometimes meant that, where the club has been financed by Farmers' Union, P.M.A., or dairy companies, the first few litters' share of the £1 11s. 6d. has been mortgaged up to two years ahead. Where this is so, the hazard is too great for much stability.

In the movement we can quote almost every extreme, but in no case has a single factor been responsible for success or failure. No doubt the greatest factor must always be the quality of the pigs distributed, when distributed, and to whom distributed. The distribution of weaners is in some measure responsible for this position.

Cost of Service.

Service must always cost something for the benefit of its continuity. For example, the Whakamara Club last year purchased for its twenty-eight members meal to the value of £313. No doubt this amount was, to some extent, made possible by the fact that a very satisfactory agreement was entered into by the club by which they were able to buy their meal at £2 a ton under ruling prices. This opportunity to give service to members and at the same time strengthen the club financially against future difficulties was lost sight of; 3d. per bag would have created a very useful reserve.

Naturally, the club will always want to give as much to its members as possible, but reserves are just as necessary in this business as in any other, and if this is not an adopted policy of the club it cannot always be in funds.

That this thought has been apparent to others is borne out in the fact that some District Councils have considered the forming of or joining some insurance scheme to guard against any major drain on the club's funds by their replacement of sows either by death or because she is of no value from their point of view as a breeder. This idea is sound, and could best be carried out by District Councils themselves. Taking the Taranaki District, with thirty clubs and, say, five hundred to six hundred members, as an example, the Council would set aside £15 (about 10s. per sow) per annum, the club members to pay 1s. per member

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from club funds. This would give from £40 to £45 a year to be used to replace sows as they were deemed of no further use.

As clubs charge from £1 11s. 6d. to £2 2s. for their weaner pigs it may be possible to collect some of this revenue from sales, as an increase in price of 1s. per pig would mean very little at the time of purchase.

Sow-replacement Schemes.

To some this might seem to be taking a risk, but in four years we have had to scrap only four sows, which would have shown us a good margin. Assuming that this rate continues or that we have to replace the whole of our stock in six years, this would enable us to issue to any club £8, which, coupled with the payment received as a chopper or even as an in-farrow sow, should enable clubs to restock. Where the sow died or had no resale value the management committee could, perhaps, give further assistance.

This is a sow-replacement scheme and should not altogether be viewed as the usual insurance scheme. Some insurance companies will accept this type of risk, but I understand that where such a policy is required the depreciation is very heavy. Some scheme, however, is very necessary. If this side of the club's finances can be arranged satisfactorily I think the £1 will be found sufficient.

Continuous Service.

No club can survive where no direct continuous service is available from the Supervisor. The breeding of pigs is one side of this business and one side only—admittedly an important one—but many good pigs have never had a chance of doing their part. When one realizes the large number of pigs that end their lives by a toboggan ride down the chute, this truth is very hard to side-step. With the majority of the clubs the amount of interest shown at the commencement of the movement has not been maintained.

The difficulty of being able to place something new before members the whole time means, as in other clubs and unions, that the great majority are quite prepared to be silent members as long as some one else is prepared to do the work.

Perhaps the best indication of the position is that, to date, we have distributed four hundred and fifty weaners, and of that total only on two occasions have I any definite record of selected sows not finding a ready demand. With boars, however, it is different. Quite often the whole complement have been castrated. At first glance this seems a sad state of affairs, but I cannot help thinking it is in our favour that such should be the case, because we shall never need as many boars as sows, and as the boar is half the herd he should always be a better animal of the breed than the sow. The one sorry feature of the position to-day is that, as pigs are distributed as weaners, no true guide is available as to conformation.

When I formed the first club I was of the opinion that as soon as it was at all possible the distribution of weaners should stop, and I am happy to state a start has been made in Taranaki to carry out that idea.

Distribution of Weaners.

The distribution of weaners is wrong. All 40 lb. weaners, be they pure or crossed, are attractive and more or less alike. A definite selection at this stage is impossible. Although small, there is nevertheless a small check when the little pig is deprived of its mother's milk. Some farmers

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guard against this by a little cod-liver oil for a week. Secondly, it is deprived of the warmth of its litter mates and quite often is given a change of food, to say nothing of, perhaps, having to fight a dozen or more strange pigs. All these circumstances go to make the weaner look miserable and tucked up—so much so that when the neighbour looks over the fence even the owner is ashamed to state which is the club pig.

Breeders of pedigree pigs in New Zealand have long recognized this, and few like to sell pigs at this age. When the fact of having to keep the pig twelve months before any return can be looked for is added, the proposition does not look so attractive. At £1 11s. 6d. for a summer weaner the price is not much above a crossbred, but in the late autumn, with little or no milk, the weaner is a problem, and if the farmer does not make proper arrangements to give him a chance the pig and farmer become a detriment to the movement.

Keeping the Pigs Longer.

As we cannot produce two litters in the summer-time it seems that we must make up our minds to keep our pigs longer under the care of our custodians, where they must have a better chance of growing into good animals. If, after the eight weeks' weighing stage, the selection committee decided to keep two, or at the most three, of the most likely boars for boars, the balance should be castrated and all pigs carried forward to five months, when the selection committee should decide which should be balloted for, the balance to be the property of the custodian. But, if the club desired it, the reject pigs could be killed for observation as pork or bacon.

Payment to custodian should be ruling hooks weight plus 15s. per pig sold for breeding; reject pigs, no payment by the club, but pigs to be the property of custodian on the understanding that they go to the works for either pork or bacon.

Service to members should be carried on to every farm by the checking of animals drawn from clubs as against the farmer's own pigs as controls. This is essential and the crux of our future success or failure. The fact that the Supervisor contacts the farmer on his own farm will do a great deal to speed up what is perhaps our greatest weakness—lack of accommodation and management.

Knowing, as we do, the lack of good conditions on many farms, the porker offers something with a far better chance of giving satisfaction than the weaner. Definite conformation, rigorous constitution, and an animal fit to be mated at a reasonable time as far as the farmer is concerned must be a very much safer line than the present one.

Service Boars for Custodians.

In the past four years the scattered position of the clubs and the desire of each club to determine its own breed of pig have often led to the sow having to be transported long distances, so much so that the cost of transport has far exceeded the cost of service.

Where this has been the case, after one or two trips "abroad" the members generally look round for something "good enough," and once that becomes the practice much of our work goes by the board. To give the clubs the type of boar they require I suggest that the District Council have the right—in fact, it is part of their work—to set up a selection committee to arrange exchanges between clubs of the two or three boars carried to pork weights on the custodian's farm, so that the custodian has on his farm an animal that not only he but also the members can make use of at a price to compensate him for his work. This pig should be shown at least once at the local show.

We hope to establish this practice during the coming season in Taranaki, as well as putting in the hands of every secretary an extended pedigree of every sow within our circuit, so that it will be possible more or less to co-ordinate the whole of our clubs for an exchange of or purchase from any club to any member. As soon as any sow's litter becomes three weeks old all clubs are notified as to numbers and weights, which allows them time to make whatever arrangements they wish.

Three bacon competitions will be held this year, one each at Wanganui, Hawera, and Inglewood.

A. and P. Shows.

Arrangements have been made for one class at Wanganui, New Plymouth, Marton, and Stratford, and two classes at Hawera. As the stock become available this side of our work will be enlarged, as we are more anxious to work with progeny than with brood animals.

In conclusion, I have met with little opposition, but, as is to be expected with farm-labour position, a fair amount of indifference, for the keeping of pigs means so much more work to some, who already have time to do only the most necessary jobs. However, the type of carcass to be seen hanging on the hooks at the works to-day gives us every reason to believe that at least some of our efforts are being appreciated.

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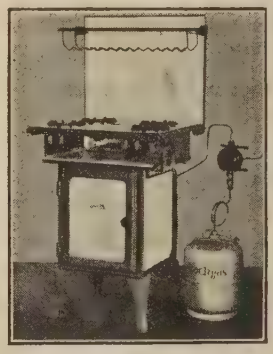

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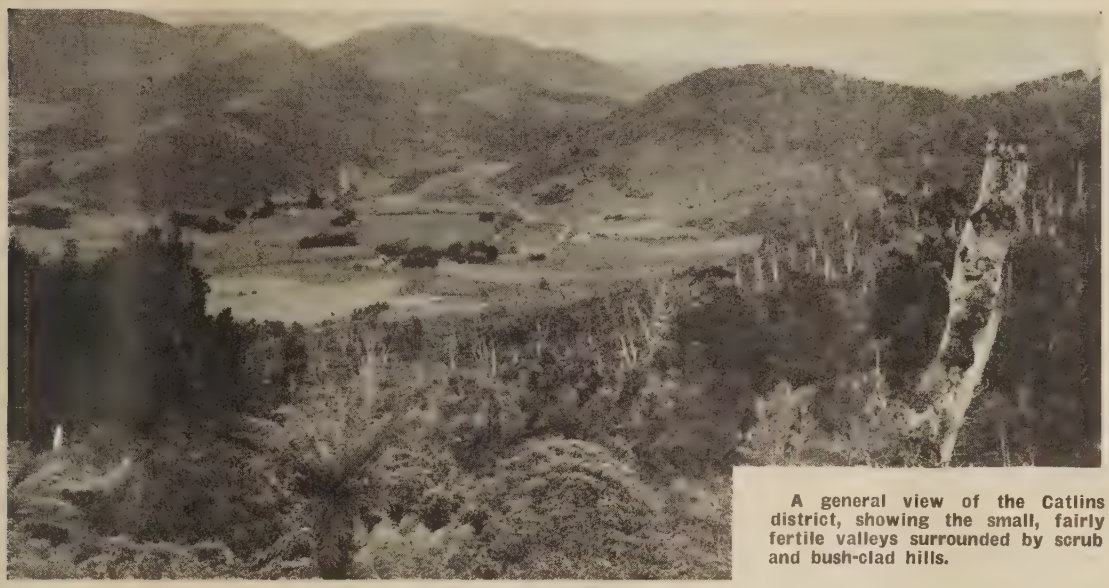


A general view of the Catlins district, showing the small, fairly fertile valleys surrounded by scrub and bush-clad hills.

Farming in the Catlins District.

Conversion of Bush Land into Farms.

A. F. Greenall, Instructor in Agriculture, Balclutha.

THE Catlins District, or what is more commonly known as the bush district of Otago, is that part of South Otago beyond the Molyneux River, extending to the southern provincial boundary of Otago and inland for some twenty to twenty-five miles. The subject-matter of this article was obtained in connection with a survey of ninety farms in the district. Various details and statistics were obtained from these ninety settlers, and general observations were made over a period of twelve months.

For convenience the district has been examined in two sections, the main portion dealt with being the area from the Catlins Lake and River to Chaslands, as representing one type of development, as apart from the area north of the Catlins River.

Dealing first with the main area; this covers the survey districts of Tautuku, Woodlands, and Rimu, which are situated in the coastal region south of the Catlins River and bounded by the Coast, the Southland provincial boundary, and the tussock runs of Kuriwao and inland Catlins.

Generally speaking, the climate is wet, cool, and dull. Temperatures are not extreme, being fairly cold in winter and fairly warm in summer. Frosts are experienced, but are not severe. Mists and misty rains are frequent during certain seasons. Rainfall is high for Otago, being in the vicinity of 40 in. to 45 in. Last year the fall was 55 in. Winds are frequent during certain seasons, but not strong or regular.

The problems of converting the heavily timbered country of the Catlin's district of Otago into farm lands are dealt with in this article, which is the first of a series resulting from a survey of the area. Many of the difficulties encountered are common to all areas where agriculture has superseded the New Zealand native bush and the practical advice contained in these articles will no doubt prove of great value beyond the confines of the investigation.

The soil is very similar over the whole area, though variations do occur. Only a geologist could confidently state the composition, but one would not be far wrong in classing it as a clay loam, high in clay of a coarse friable nature and high in humus and undecayed vegetable matter. Signs of a hard ironstone pan are present in numerous places, sometimes combined with a black layer of a peaty nature, particularly in low-lying swamp areas or on some of the slopes previously covered by kamahi and birch.

Without doubt, a considerable amount of leaching due to high rainfall and slow surface movement of water owing to dense forest-growth has taken place. As the result of this leaching and the presence of undecayed organic matter the soil is inclined to be sour and low in fertility, and consequently responds to lime manure and adequate and deep cultivation. Movement of soil moisture up or down appears to be slow as a result of peat and hard pans. The parent rock is hard, being probably ironstone, sandstone, &c.

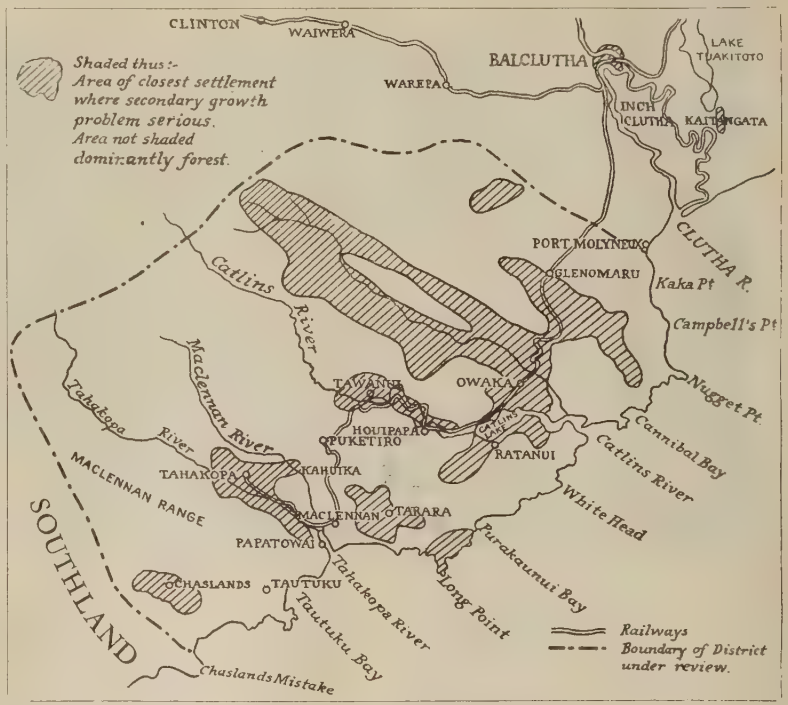
Addition of lime, aeration, and thorough cultivation result in a fertile soil. Although the soil may have been formed during another period of vegetation, it has evolved under rain forest.

From Bush to Grass.

An outline of the evolution of grassland farming in the Catlins district will convey the right impression of what is being done now, and what will be attempted in the direction of deforestation in the future.

Felling the bush is the first step. The criterion of good bush-felling is to provide eventually a dense network of dry timber that will carry a fire and burn fiercely. When undergrowth is heavy this entails underscrubbing to deal with lawyers and creepers, for when the bush is felled these will grow and prevent a good clean burn.

In the case of deciduous trees cutting when in full leaf is desirable, and this work should be carried out as quickly as possible to ensure uniform drying. The cutting and felling is hard toil, being mostly axe and saw work. It is essential that two or more men work together, however, as accidents may occur in spite of every precaution. Partial scarfing of trees which are crashed by the complete felling of a large tree on a higher level is not generally practised, as lawyers and creepers survive and prevent a good burn.



A plan of the area reviewed.

Best Time for Burning.

The time at which evergreen trees are cut is immaterial, provided felling is carried out early enough to ensure that the fallen bush will be dry when burning weather is experienced. It is considered that late spring is the best time for felling as the trees have rushed up soft, sappy growth and are then entering a more dormant period. The time of burning is influenced mainly by the weather. Burning in the autumn, following a spring felling, is the most popular in this district, and is most reliable as a rule, though the most spectacular results are obtained from an early spring burn following a summer felling, provided a wet winter and spring has not hastened weed-growth. In the latter case the solid wood appears to burn well and there is much less "tracking" of the burn to do to enable stock to work over the area efficiently.

The cost per acre of felling varies considerably from one area to another and is largely dependent upon several factors. These are accessibility, density, and amount of undergrowth, these last two factors being dependent upon whether the area has been previously milled or not. Averages are unreliable, but £3 per acre might be accepted as an average cost.

Burning the fallen bush is a tricky task. It is advisable to wait for a hot day with a favourable wind. The wind should be strong enough to fan the flames, yet not of such force to rush the fire over the area or endanger adjacent unfelled areas of forest or fields of grass. Forest fires are necessarily a feature of all bush districts, but care should be exercised to ensure reasonable safety.

Clean Burn Desirable.

Although the desirability of a clean burn may be emphasized at this stage, there is another point that requires emphasis. The cycle of bringing bush land into grass may be compared with the work of a bricklayer. Upon the firmness of the previous bricks depend the strength of subsequent layers of bricks, moreover the whole plan must be carefully planned, keeping in view the purpose of the component bricks.

Similarly the system adopted for felling must provide a firm foundation for burning, both of which must be properly

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executed before successful establishment of pasture can be expected, all of which are of little use unless suitable management and type of grazing animals is adopted. A fault in any one step will cause a partial break in the chain and the whole process will be retarded for several years. A good, clean burn is the keystone of success.

Following on the burn, and depending upon its effectiveness, a system of tracking or opening up must be carried out. This is done to facilitate seeding and to allow the grazing animals to " work " the burn, controlling weed-growth as well as the growth of pasture. This is the first important phase in the control of secondary growth.

The type of original bush encountered.

Surface Sowing of Seed.

The next process is the surface sowing of the seed on the bush burn. Seeding should take place as soon as possible after burning in order to make use of the warmth and cover of the ashes for germination, and to take full advantage of the fertility of the ashes before the rain leaches it out. If this is done the grass gets an equal start with the weed-seeds present and the pasture has a better chance of establishing.

The method of grazing adopted is in most cases influenced by the location and condition of the burn. Usually the seed is sledged or packed up leading ridges and deposited at intervals along the top of the burn. Sowing is carried out by hand, the seed being broadcast from a tray or canvas container carried in front of the operator. It is essential that the container should be of such a style as to allow freedom of action for both arms.

The containers are filled from the chain of sacks and replenished as required. In some cases sighters are used to ensure that all the burn is being covered. Perhaps the most important point in surface sowing is to see that the right grass-mixture and strain of species within the mixture is used.

A Typical Mixture.

The following mixture represents the average type of pasture mixture adopted in the Catlins district :—

	Pounds per Acre.
Cocksfoot	17
Perennial rye-grass ..	13
Timothy	2
Dogstail	½
White clover	2½
Total	35

Italian rye-grass, when included, is sown at from 5 lb. to 10 lb. per acre.

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The type of rye-grass - white-clover - cocksfoot pasture that can be maintained in the Catlins.

Trefoil, *Lotus major*, or red clover are sometimes sown either alone or mixed to the extent of 1½ lb. per acre.

The above figures emphasize the importance that was placed on cocksfoot and white clover in the mixture. As indicated, the average rate of seeding is in the vicinity of 35 lb. per acre. This figure varies considerably and depends largely on the density of stumps and logs, &c., but generally the seeding is quite high.

This analysis of the pasture mixtures reveals the fact that first-class pasture mixtures suitable only for very high-class soils subject to ideal management have been largely used in the past. As already indicated, the soil types in this district are not very fertile and can be classed as second and third class. It is a well-established fact that to maintain a first-class pasture in a productive state soil fertility must be high. It is obvious, then, that the use of such pasture mixtures has been one of the main factors bringing about deterioration in the Catlins.

Second-class Soil.

On a second (or third) class soil a grass mixture suitable to this standard of fertility should have been employed, for with such a mixture there is a reasonable chance of holding the country and preventing secondary growth. There are valleys throughout the district where very fine pastures can be maintained providing liming and top-dressing are practised, but on the hills a second-class mixture should have been used. Cocksfoot does exceptionally well under suitable management and should be included in all mixtures, but the inclusion of some of the other high-fertility grasses at the rates mentioned is a doubtful procedure.

Obviously, brown-top should be included in mixtures for sowing all but the most favoured spots, while *Poa pratensis* is another species which should be given consideration. No doubt, opposition to the inclusion of such species as brown-top and *Poa pratensis* will be met with by settlers in the district, for they are not grasses suitable for the production of butterfat, but the point is that with an option between a second-class pasture or secondary growth the choice must go to the second-class pasture.

A mixture somewhat along the following lines for country subject to rapid deterioration should be adopted :—

	Pounds per Acre.
Certified cocksfoot ..	10
Certified perennial rye-grass	11
Certified brown-top ..	1
Certified white clover ..	1
Poa pratensis	1
Timothy	2
Crested dogstail	3
Lotus major	1
Total	30

Inclusion of Turnips.

The inclusion of turnip-seed in the mixture depends upon the season of sowing. In a spring or summer burn the inclusion of 1 lb. of swede or soft turnip is a sound practice. In several instances a good crop of swedes has provided an attractive bulk of feed without interfering with the establishment of the pasture. With such a crop stock penetrate the burn much more efficiently and so help to remove possible cover for weed-growth. In autumn burns late sowings are inimical to the development of a heavy crop of swedes or turnips. The inclusion of from 5 lb. to 10 lb. of Italian rye-grass to serve the same purpose is worth considering.

It is perhaps unnecessary to emphasize the desirability of bringing in only an area as large as can be effectively stocked with the number and type of cattle necessary to control young growth of fuchsia, wineberry, fern, &c. Where a large area is being developed stock concentration is rarely high enough to cause effective control by eating and trampling developing scrub.

Where an area is heavily stocked during the early life of a recently sown burn, by using the area as a night paddock, a run-out from swedes or chou moellier, or a concentration camp for hay feeding, all leafage is readily removed and an area clear of scrub results. The concentration is conducted at the expense of the already clean areas, but it is preferable to make a good job of a small area, rather than an indifferent job of a large one. Concurrent with this concentration of stock should be the frequent piling of logs and decaying wood around the stumps of trees harbouring bidi-bidi, ferns, &c. The piles are fired when climatic conditions are suitable. One becomes more convinced of the importance of hard work and prolonged effort at this critical stage, the more one sees the success that has accompanied such effort.

(To be continued.)

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Improvement in Danthonia Swards.

Top-dressing and Clover Establishment.

J. E. Bell, Instructor in Agriculture, Auckland.

EVERY one knows of the value of danthonia in its ability to carry a a fire which scorches the invading ti-tree or fern and yet does not harm the danthonia with its deep-set crown. The illustration shows young ti-tree in flower in the foreground invading *Danthonia pilosa* pasture. The area in the background is free of ti-tree. Between the ti-tree infested foreground and the clean pasture behind runs a track which cannot be seen in the photograph because of the height of the pasture. There is little doubt that the clean pasture owes its freedom from ti-tree to the burning of the danthonia the previous summer, killing the young seedling manuka, while the pasture in the foreground escaped burning because the fire did not jump the bare patch in between.

Predominant Species.

Danthonia occupies millions of acres in New Zealand, and is probably the most predominant grass species in this country. Its ability to exist in hard, dry conditions, and to hold back secondary growth and yet produce enough fodder to graze about one dry sheep per acre has made it the most important pasture plant for the hill-country sheep-farm where improvement in fertility by top-dressing to fit the soil for higher-producing species is not possible.

It comes in when the better species succumb as the fertility of the hill country declines to form, with some alteration to stocking and burning, a fairly stable sward. It is therefore fitting that we should recognize its virtues and pay better tribute to this lowly plant. Other low-producing species suffer in comparison with *Danthonia pilosa* in their liability to the sod-bound condition, resulting in negligible production and their lower ability to carry a sweeping fire and remain unharmed.

Steps in the improvement of the danthonia sward are (1) no burnings and the use of cattle, and (2) top-dressing, preceded, if possible, by clover establishment. Probably the most predominant grass species in New Zealand, danthonia has a definite value in its ability to carry without harm a fire which scorches the invading ti-tree or fern.

Erosion of Soil.

Unfortunately, other plants besides ti-tree suffer through the burning. Clovers are rare in a danthonia sward frequently swept by fire. There is no bottom in the sward, and much bare soil is exposed to wind, rain, and running water. Piece by piece particles of soil are loosened by rain and wind and blown away by the wind or carried downhill by the running water. Layer by layer the top soil is removed, until on many danthonia hills nothing remains but the subsoil. So imperceptible is the removal that many farmers do not believe that this insidious process, called sheet erosion, is occurring or has occurred on their hills.

On danthonia hills where ti-tree is a menace of some importance and where the use of fertilizer is well-nigh impossible there appears no getting away from the burning of the danthonia. Either that has to be done or the area allowed to go back to second growth, but the burning should be confined to the amount necessary to keep ti-tree in check. The indiscriminate burning of danthonia is to be deplored. In fields where the danthonia becomes rank over summer and where there is little or no ti-tree invasion young cattle should be employed to stock the danthonia in the autumn and early winter so that it is eaten down, allowing fresh growth to come away for the sheep.

Burning merely to produce young fresh growth should not be done. The ease with which burning is carried out

Showing the invasion of Danthonia pilosa pasture by young ti-tree in flower in the foreground. The area in the background owes its freedom from ti-tree to the burning of the danthonia the previous summer, killing the young seedling manuka.

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and the difficulties and loss of money sometimes encountered in stocking with cattle have tempted, and will always tempt, farmers to use the match. The motto of the danthonia hill-country farmer should not be "Leave your matches at home," but always remember that "Every match used means loss of some of the fertile top-soil."

Stocking with Cattle.

Some farmers with danthonia country on which it is possible to use fertilizer and on which ti-tree is not a great menace can check erosion by "keeping the matches at home" and by stocking with cattle. On danthonia swards under such management suckling clover and some *Lotus major* make a timid appearance and may be encouraged by top-dressing. Such top-dressing does not improve carrying-capacity a great deal, but it does improve the feeding value of the pasture. Lambs do better, and the pasture can be graded up more definitely from dry sheep to wet sheep country.

If white clover and subterranean clover, which are of higher production than suckling clover and *Lotus major*, could be established in danthonia swards prior to or at the beginning of top-dressing, then top-dressing would have still greater results, and better grasses, such as crested dogstail and perennial rye-grass, would appear. The results from top-dressing would then become so great that most farmers with the more easy danthonia country would be encouraged to use it.

Establishing Clovers.

The present problem is the establishment of such clovers. When simply broadcast on the danthonia sward the strike has been poor and much seed has been wasted. The Fields Division is at present experimenting with methods of establishing white clover, subterranean clover, and *Lotus major* on danthonia swards on hilly country. One method under trial is the closing-up of the danthonia from stock from October until March and the sowing of the seed in the autumn among the danthonia roughage. It is expected that the seed will be tramped into the ground by cattle feeding on the roughage in the autumn, and, being shaded by the roughage, the little seedlings will not succumb to spells of hot sunny weather.

If a good cover of clover can be accomplished it is hoped that much of our marginal danthonia country will be improved in carrying-capacity until the stage is reached when the fertility of the soil will be on the upgrade instead of in the other direction. The improved sward will result in less soil being exposed to sheet erosion and a greater production of grass which, by dying down or through the stock, improves the humus content of the soil.

The steps, then, in improvement in the danthonia sward are first, no burning and the use of cattle, and, secondly, top-dressing preceded, if possible, by clover establishment.

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Fruit Crop Prospects.

Summaries from Principal Districts.

Contributed by the Horticulture Division.

THE Director of the Horticulture Division has received the following reports from his officers regarding the fruit crop prospects at the end of October, 1938 :—

Auckland.

Apples.—Good blossoming, and, under present conditions, should be a heavy setting.

Pears.—Indications of an excellent crop.

Quinces.—Good.

Peaches and Nectarines.—Promise of a heavy crop.

Plums.—Light setting of most varieties.

Lemons. — Very heavy crop still on trees ; very light blossoming.

Oranges.—Heavy blossoming, with indications of a good crop.

Strawberries.—Showing well.

Tomatoes.—Indoor, looking well ; extensive outdoor plantings.

Hamilton.

Apples.—Good showing on most varieties ; Cox's Orange and Delicious lighter than last season.

Pears.—Setting fair crops, lighter than last season.

Peaches and Nectarines.—Heavy setting on most varieties.

Plums. — Japanese heavy ; English varieties light to moderate.

Strawberries.—Light.

Gooseberries.—Average.

Tauranga.

Apples. — Jonathan good ; Dunn's patchy ; Delicious patchy ; Ballarats light.

Peaches and Nectarines.—Heavy.

Plums.—Good.

Lemons and Oranges.—Fair.

Gisborne.

Apples.—Blossoming of Delicious and Ballarat light, and crop likely to be below average. Heavy blossoming on Cox's Orange and Sturmer. Patchy on other varieties.

Pears.—Average setting of fruit.

Stone Fruits.—Prospects of average to heavy crop.

Citrus Fruits.—Good prospects.

Hastings.

Apples. — Gravenstein light ; Cox's Orange light ; Jonathan light ; Dunn's very light ; Delicious very light ; Sturmer normal ; Dougherty light ; other varieties medium ; Ballarat very light.

Pears and Apricots.—Normal crops.

Quinces and Cherries.—Good.

Peaches, Nectarines, and Plums. — Heavy.

Lemons.—Light.

Palmerston North.

Apples.—Medium crop generally ; Cox's Orange light to medium ; Jonathan light ; Dunn's light ; Delicious medium ; Sturmers heavy ; other varieties medium.

Pears.—Heavy.

Plums.—Heavy.

Other Stone Fruits.—Light.

Masterton.

Apples.—85 per cent. of normal crop. Cox's Orange good setting ; Jonathan and Dunn's fair to good ; Sturmer medium ; other varieties medium.

Pears.—Normal crop setting well.

Cherries.—Heavy setting.

Raspberries.—Light crop.

Gooseberries.—Medium crop.

Wanganui.

Apples. — Normal crop ; Sturmers heavy ; Delicious good ; other varieties average crop.

Pears.—Average crop.

Tomatoes.—Glasshouse good.

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Nelson.

Apples.—Gravenstein normal; Cox's light; Jonathan good; Dunn's medium; Delicious patchy, expect light crop; Sturmer normal; Dougherty good; other varieties moderate to good; Ballarat and Statesman light.

Pears.—Good; Winter Nelis not setting well.

Quinces and Tomatoes.—Normal.

Plums and Cherries.—Good.

Peaches and Nectarines.—Normal.

Raspberries.—Normal development.

Strawberries.—Showing well.

Gooseberries.—Light.

Mapua.

Apples.—Gravenstein fair to average; Cox's Orange very light to fair; Jonathan normal to heavy; Dunn's very light; Delicious very light to average; Sturmer normal to heavy; Dougherty fair to average; Statesman light to average; other varieties fair to good.

Pears.—Average setting; Winter Cole good; Winter Nelis and Beurre Bosc light to average.

Motueka.

Apples.—90 per cent. of normal crop; Gravenstein good; Cox's fair; Jonathan good; Dunn's medium; Delicious medium; Sturmer good; Dougherty good; other varieties fair to good.

Pears.—Slightly under average.

Quinces.—Good.

Peaches, Plums, and Cherries.—Fair to good.

Nectarines, Apricots, and Raspberries.—Fair.

Blenheim.

Apples.—Prospects of a slight increase in production over last year. Cox's generally light; Jonathan light to average; Sturmer average to heavy; Dougherty average; other varieties normal to heavy.

Pears, Peaches, Nectarines, Cherries, and Raspberries.—Average to heavy.

Quinces and Plums.—Light to average.

Apricots.—Light.

Strawberries.—Showing well.

Gooseberries.—Heavy.

Tomatoes.—Hothouse, heavy crop.

Christchurch.

Apples.—Exceptionally heavy blossoming on all varieties.

Pears.—Heavy blossoming, indications of normal crop.

Peaches, Nectarines, Apricots, Plums, and Cherries.—Good crops.

Raspberries and Strawberries.—Showing well.

Tomatoes.—Glasshouse, normal crops developing.

Dunedin.

Apples.—Promise of exceptionally heavy crop.

Pears.—Promise of exceptionally heavy crop.

Peaches and Nectarines.—Heavy.

Apricots and Plums.—Good.

Strawberries and Raspberries.—Showing well.

Alexandra.

Apples.—Cox's Orange normal; Jonathan normal; Dunn's light; Delicious light; Sturmer heavy; Dougherty normal; other varieties normal.

Pears.—Promise of good crop in main varieties.

Quinces.—Heavy.

Peaches and Nectarines.—Promise of heavy crops.

Apricots.—Heavy crops except in some instances where frost damage occurred.

Plums.—Heavy; in some instances crop reduced by frost damage.

Cherries.—Heavy, but severe damage by frost in some orchards.

Strawberries.—Showing well; reduced acreage this season.

Tomatoes.—Glasshouse looking well.

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Roxburgh.

Apples.—Very heavy setting of fruit in all varieties; Cleopatra and Dunn's very heavy.

Pears.—Heavy.

Peaches, Nectarines, Apricots, Plums, and Cherries.—Very heavy. Weather conditions to date have been very favourable for all fruits, and, given a continuance of same, heavy crops are anticipated.

Honey Crop Prospects.

THE Director of the Horticulture Division has received from the Apiary Instructors the following reports concerning the honey crop prospects at the end of October, 1938:—

Auckland.

The prospects of honey production for the forthcoming season in the Auckland and the North Auckland districts at the present time are fair. The winter conditions for the bees were favourable, but a considerable amount of wind has been experienced during the spring, and apiary operations have been affected accordingly. Colony strength generally, however, is in good order, and the pastures have been stimulated recently by a beneficial rainfall.

Hamilton.

The rainfall during October was exceptionally light and was only 1.18 in., as against the average for the month of 4.52 in. for Hamilton. These conditions obtained more or less throughout the South Auckland district. Consequently, clover pastures are backward for this time of the year.

The dry conditions enabled the bees to work freely the straight willow, barberry, and native trees. On the whole, the bees throughout the district are in normal condition for this period of the year. At the time of writing, 3rd November, steady rain is falling; thus the prospects for the season ahead are much brighter than a week ago.

Hastings.

Present indications give promise of good clover blossoming. Good rains have been experienced throughout the districts, and, providing good weather prevails, there should be good crops of honey harvested.

Palmerston North.

Prospects continue to be favourable. Nectar secretion was restricted somewhat during the past month because of rain and some squally intervals. Clover is not quite so forward as it was this time last year.

Nectar is available in most districts when foraging-conditions permit. A somewhat earlier season is anticipated in some parts. Temperatures remain satisfactory, and hive condition generally is promising.

Christchurch.

A severe winter has been experienced in this province. Low temperatures have ruled throughout, and the rainfall is several inches above last year.

Bees wintered exceptionally well, with few losses, and as brood rearing ceased as a result of the intense cold only a small quantity of honey was used. This left ample stores for spring requirements, and at the opening of the willow flow colonies were in a forward condition and, where weather conditions were favourable, stored a considerable quantity of honey. Swarming is not yet general, but if the present colony's strength is maintained it will, no doubt, prove difficult to control.

The pastures are in excellent condition, and the prospects for the honey crop on the medium and light soil are good. The extent of the crop, however, will be governed by the rainfall and weather generally during the next two months.

Dunedin.

The weather during the past winter has been especially cold in the Dunedin districts, and much boisterous weather has been experienced during the early spring, accounting for big losses of field bees. Where adequate stores were provided bees have wintered well, but there have been big losses with those put down for winter with light stores.

The conditions of hives are fully a fortnight later than normal, but, with a fairly liberal spring rainfall, pastures are looking well, and at present the prospects are for a good honey crop, given reasonable climatic conditions.

— — —

Rates of the levy on all wool produced in New Zealand have been fixed as follow: For each bale, 6d.; for each fadge, 3d.; for each bag or sack, 1d. The levy is charged on all wool produced in New Zealand which at any time during the season commencing on 1st October, 1938, is exported from New Zealand or is delivered to a wool-manufacturer for use in New Zealand

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PROSPECTUS.

A prospectus giving all details may be obtained from the Director of the Fields Division, Department of Agriculture, Wellington, or from the Manager, Ruakura Farm of Instruction, Hamilton.

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The course of instruction is open to lads of not less than sixteen years of age and of reasonable educational attainments.

Prevention of Hydatids.

Act Operates on 1st January.

A. E. Morrison, Solicitor, Department of Agriculture.

THE Dogs Registration Amendment Act, 1937, contains legislative provision in the direction of effecting a reduction in the prevalence of hydatid disease in the Dominion. The Act comes into force on 1st January, 1939, when local authorities are required to supply dog-owners the prescribed quantity of the approved remedy for treating dogs. Arrangements have been completed for the Government to purchase the required amount of the approved remedy in bulk and for its distribution to individual local authorities.

By the Dogs Registration (Prevention of Hydatid Disease) Regulations 1938, which come into force on the same date, the preparation known as arecoline hydrobromide shall be the approved remedy to be used in the treatment of dogs for hydatid disease. The remedy has been decided upon after exhaustive research by the Hydatid Research Committee of the Otago Medical School in consultation with officers of the Health Department as being the most effective drug for the purpose.

Instructions as to the use of the approved remedy are set out in the regulations, and a printed copy of the instructions must, in accordance with the provisions of the Act, be given to each person registering a dog.

The fee payable by dog-owners in respect of the supply of the approved remedy is fixed at 1s. per dog, except where a dog is registered for the first time after the month of July in any year. In the latter case the fee is fixed at 6d. The prices so fixed are intended to cover the actual cost of purchasing the drug plus a small margin for administrative expenses.

Copies of the regulations, which are administered by the Department of Internal Affairs, are obtainable on application to the Government Printer, Wellington, price 2d. per copy, plus postage 1d., remittance with order.

There are a number of farms with small plantings of pampas-grass in the Nelson and Takaka districts. Nowhere in the district, however, could this plant be claimed as an economic success from the point of view of its provision of supplementary fodder.

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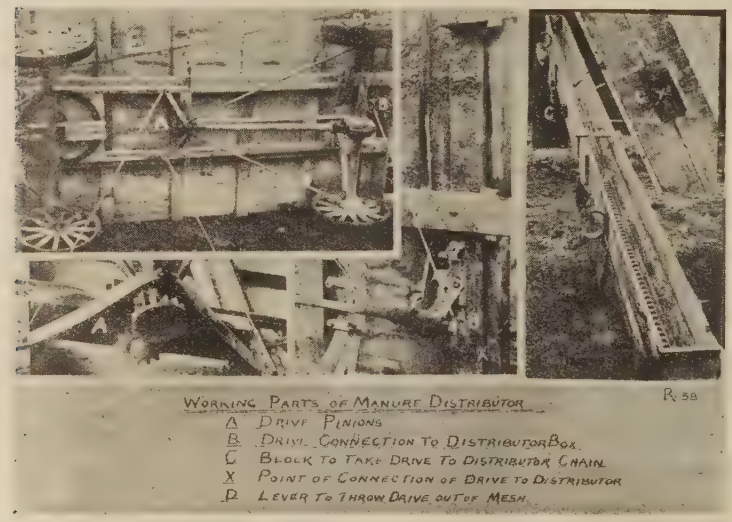
WORKING PARTS OF MANURE DISTRIBUTOR
A DRIVE PINIONS
B DRIVE CONNECTION TO DISTRIBUTOR BOX
C BLOCK TO TAKE DRIVE TO DISTRIBUTOR CHAIN
X POINT OF CONNECTION OF DRIVE TO DISTRIBUTOR
D LEVER TO THROW DRIVE OUT OF MESH
R. 58

AS a number of readers have requested further information in the making of the manure-distributor described on page 243 of the September issue of the *Journal*, the following details are given to assist those interested in the construction of a similar machine.

The main point to be made clear is the assembly of the drive. As stated in the previous article, the drive is obtained from the differential via the tail-shaft through a return shaft. The method adopted can be seen in Fig. 4, the intermediate drive being obtained by mounting the ends of tail and return shafts to a cross member between the chassis with suitable pinions fitted (A in Figs. 1 and 4), those illustrated being obtained from an old reaper-and-binder.

The return shaft is mounted on to a cross member on the underside of the decking at the rear of machine, giving the final drive through a crank fitted to the end (B in Figs. 1, 2, and 4).

To throw the final drive out of mesh, a lever (D in Figs. 1 and 2) is fitted to the return shaft, and is pivoted to a longitudinal support of the decking. A light rod (E on Figs. 1, 2, and 4) runs from the end of this lever to the front of decking, where it is in a handy position for the driver to operate.

The distributor-box is made from 12 in. by 1 in. dressed timber. It is 20 ft. long, and is joined at ends, making the width at top 16 in. and at the bottom 1⅜ in. An iron plate, 6 in. by $\frac{1}{16}$ in. is attached to the bottom, being lapped to the outsides. Holes of $\frac{5}{8}$ in. are drilled every 3 in. in this plate. Another plate,

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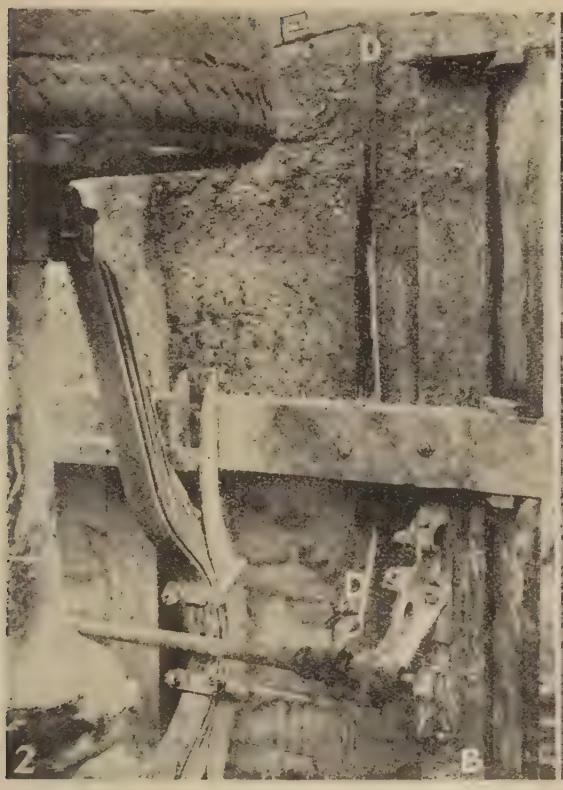
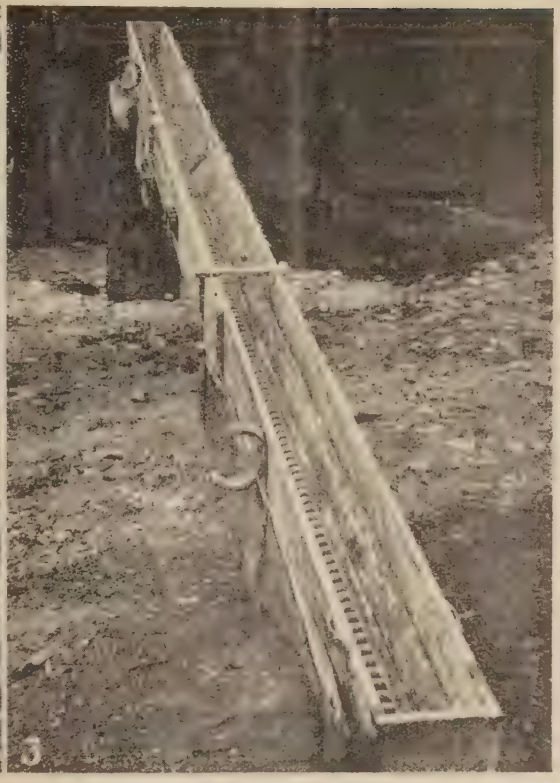
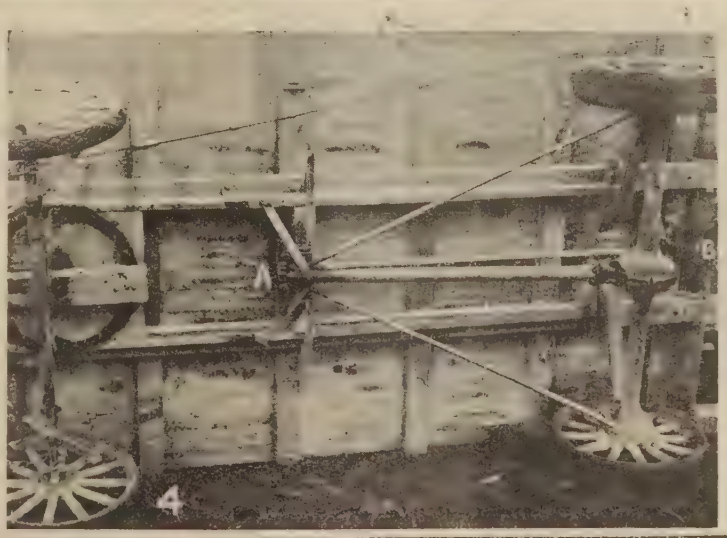




2½ in. by $\frac{1}{16}$ in. similarly drilled, is fitted over this in such a way that it will slide and bring the two sets of holes in register It will be seen that by sliding the top plate over the bottom reduces the size of the holes, thereby regulating the quantity per acre.

In order to expel the manure a 1½ in. binder-chain is laid over the top plate and attached to a crank at each end. The spindles of these cranks protrude through the side of box, being connected by a wire. In the centre of this wire a hardwood block (C in Fig. 1) is fitted to take the drive from the return shaft (x----+--x, Fig. 1). In operation, the revolving crank on return shaft transmits the drive via the block (C in Fig. 1) to the binder-chain, which is drawn to and fro at each revolution.

It will be noted that the implement illustrated is fitted with solid rubber tires, which have been found more satisfactory for hilly country.



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Pig Census Returns.

Amounts of Meal Used.

M. J. Scott, Superintendent of the Pig Industry.

THE census returns from 182 farms which were discussed in last month's issue of the *Journal* under the heading of "Pig-meat Produced per 100 lb. of Butterfat" have now been examined from the viewpoint of amounts of meal used. The farms are grouped as follows:—

A: Farms on which the meal used is less than 5 per cent. of the total feed supply.

B: Farms on which the meal used lies between 5 per cent. and 10 per cent.

C: Farms on which the meal used lies between 10 per cent. and 20 per cent.

D: Farms on which the meal used is more than 20 per cent. of the total feed supply.

Group	A.	B.	C.	D.
Number of farms	99	55	19	9
Averages of—				
Pounds of meal used per 100 gals. milk	2¼	8	19	34
Number of cows per farm	60	54	44	37
Number of sows per farm	4·6	5·1	6·1	3·7
Cows per sow	13·0	10·5	7·2	10·0
Production per sow—				
Pounds of pig-meat	974	938	805	1,064
Number of pigs—				
Born	13·3	13·4	13·3	14·5
Bought	1·4	2·6	1·3	0·6
Sold	10·8	11·7	10·6	12·2
Died	3·3	2·7	2·3	3·0
Feed used to produce 100 lb. of pig-meat—				
Total (lb.)	827	682	575	646
As milk (gallons)	704	570	452	475
Meal (lb.)	15	49	85	162
Other feed	108	63	40	9
Average weight of pigs sold (lb.)	90	79	77	87
Pig-meat for 100 lb. butterfat (lb.)	35·7	43·7	55·1	52·0
Earning-value of 1 gallon of milk*	0·78d.	0·89d.	1·02d.	0·75d.

* Pork at 6d. per lb., meal at £14 per ton, other feed at £2 10s. per ton—no deductions for labour or overhead.

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A.J.

From the last line of the table it will be seen that there is a gradual increase in the earning-value of skim-milk up to the stage of using 19 per cent. of the total feed as meal, but that when the meal is increased to 34 per cent. the net value of skim-milk suffers. This may be an example of the law of diminishing returns. At least 5 lb. of feed are required to produce 1 lb. of meat; as grain is at £14 per ton, the 5 lb. of feed costs 7½d., and the 1 lb. meat is worth 6d.

Hence, a stage must be reached when the excessive use of meal lowers net profit. The maximum return for skim-milk from these and other figures seems to be obtained when 1 cwt. of meal is used as pig-feed for every cow milked. This means increasing the meal used on the average by about two and a half times the amount now used, and improving returns by 10 per cent. to 12 per cent.

Grain Used.

At the top of the table it will be seen that there is a tendency for little grain to be used where many cows are milked. The amount of grain does not appear to affect the number of cows per sow, this, in fact, being largely determined by the production per sow and the efficiency in the use of feed. When each sow produces much pig-meat the ratio "cows to sows" rises; where feed is used efficiently it falls. This is seen in the table.

The amount of grain used does not appear to influence the numbers of pigs per sow born, bought, sold, or died. As in last month's notes, high returns are obtained when feed is used efficiently, and from the table "Total feed used to produce 100 lb. of pig-meat" it will be seen that efficiency increases through groups A, B, and C, and falls off again in group D This is most disappointing, as it is common experience that the use of meal does reduce the total amount of feed required to produce a pound of meat.

If the amount of feed required to produce 100 lb. of pig-meat in group D had been as low as that in group D of last issue the return for milk would have been 1·09d. per gallon; if it were as low as that in group E last issue, the return would be 1·32d. per gallon. This accidental decrease in efficiency of feed conversion is a more probable explanation of the poor results obtained by group D than the "law of diminishing returns" mentioned previously.

Certificate of Record Testing.

Contributed by Dairy Division.

THE following list gives particulars of performances under the C.O.R. test of those cows which received certificates during November:—

Name of Cow and Class.	Tested by	Age at Start of Test.	Fat required for Certificate.	Yield for Season.		
				Days.	Milk.	Fat.
YEARLY DIVISION.						
Jerseys.						
Junior Two-year-old.		Yrs. dys	lb.		lb.	lb.
Tolgarth Idalia ..	H. H. Sutton and Sons, Waihi	1 340	275·5	365	9,137·9	527·48
Restholme Joy Girl ..	N. A. Gunn, Rukuhia	2 47	280·2	365	9,287·1	525·38
Maple Brunette ..	J. H. Sherrard, Otaua, Waiuku	2 51	280·6	348	8,754·2	501·04
Wattles Pierette ..	F. C. Ross, Feilding	2 15	277·0	365	8,127·4	467·77
Middlemore Joan's Pride	M. Maras, Maungaturoto	2 22	277·7	365	7,648·1	454·47
Wattles Claret ..	F. C. Ross, Feilding	2 46	280·1	365	8,560·3	444·61
Middlemore Monica ..	M. Maras, Maungaturoto	2 2	275·7	365	6,338·4	385·37
Selside Bonnie ..	J. Gibson, Stratford	2 19	277·4	333	6,427·3	376·89
Bedfordale Lady Diana	Mrs. G. A. Foster, Papakura	2 23	277·8	328	5,828·8	372·48
Brooklands Fury ..	G. Hewitt, Waimana	2 7	276·2	257	6,789·0	342·87
Senior Two-year-old.						
Ebors Lady Lucy ..	R. J. Wilson, Putaruru	2 337	309·2	306	12,772·6	649·75
Tolgarth Elite ..	H. H. Sutton and Sons, Waihi	2 328	308·3	365	10,563·7	606·85
Tolgarth Golden Mint	Ditto ..	2 360	311·5	365	10,077·5	601·21
Caledonia Beauty ..	W. P. Begg, Arapohue, Dargaville	2 361	311·6	365	9,707·6	558·91
Stirling Blonde ..	J. A. Moffat, Turiwiri	2 344	309·9	365	9,156·0	529·94
Middlemore Rosemary	M. Maras, Maungaturoto	2 307	306·2	365	8,696·0	497·60
Senior Two-year-old—continued.						
Ebors Annabel ..	R. J. Wilson, Putaruru	2 332	308·7	306	9,886·1	493·64
Kiteroa Gamboge Victress	S. I. Crookes, Auckland	2 334	308·9	331	8,701·9	493·52
Middlemore Silver Mine	M. Maras, Maungaturoto	2 363	311·8	365	8,041·2	483·19
Brooklands Corona ..	G. Hewitt, Waimana	2 360	311·5	277	8,290·2	414·33
Maureen of Tralee ..	A. Devine, Tamahere	2 257	301·2	365	6,712·3	368·54
Ebors Rachel ..	W. J. Wilson, Putaruru	2 157	291·2	306	6,278·1	336·37
Three-year-old.						
Glamorgan Soumise Vivan	S. G. Morgan, Eltham	3 310	343·0	365	11,724·5	675·45
Kiteroa Gamboge Mab	S. I. Crookes, Auckland	3 48	316·8	363	11,009·3	608·96
Rewa Chloral ..	Mrs. E. M. Hardy, Waganui	3 333	345·3	365	10,625·4	591·67
Kiteroa Gamboge Cora	S. I. Crookes, Auckland	3 334	345·4	365	10,192·7	565·59
Stirling Vera ..	J. A. Moffat, Turiwiri	3 355	347·5	365	9,486·4	541·63
Wattles Starling	F. C. Ross, Feilding	3 315	343·5	365	9,765·7	528·99
Manakoa Nigger ..	A. H. Wright, Waiuku	3 352	347·2	365	9,081·0	497·09
Alfalfa Unity ..	Estate F. J. Saxby, Hamilton	3 274	339·4	365	9,180·8	481·25
Four-year-old.						
Nordby Park Diana ..	M. Cramer, Te Tipua, Gore	4 327	381·2	365	8,517·8	573.27
Ebors Astria ..	R. J. Wilson, Putaruru	4 37	352·2	305	11,126·5	567.47
Kiteroa Gamboge Nancy	S. I. Crookes, Auckland	4 7	349·2	338	9,024·0	513·82
Wattles Cherry ..	F. C. Ross, Feilding	4 4	348·9	365	9,499·0	497·25
Kiteroa Gamboge Goldie	S. I. Crookes, Auckland	4 74	355·9	365	7,534·3	449·11

YEARLY DIVISION—*continued.*

Jerseys—*continued.*

Name of Cow and Class.	Tested by	Age at Start of Test.	Fat required for Certificate.	Yield for Season.		
				Days.	Milk.	Fat.
		Yrs. dys	lb.		lb.	lb.
Four-year-old—contd.						
Awa Countess ..	A. J. Blake, Waipawa	4 334	381·9	305	8,303·1	445·17
Kiteroa Emperor's Dainty	W. C. Graham, Henderson Valley	4 85	357·0	365	7,575·5	444·00
Ebors Marcia ..	R. J. Wilson, Putaruru	4 38	352·3	213	8,717·9	423·07
Ebors Lady Molly ..	Ditto ..	4 287	377·2	306	7,419·3	396·46
Selside Pride ..	J. Gibson, Stratford	4 167	365·2	281	6,576·3	381·97
Royal Oak Anella ..	A. J. Hale, New Plymouth	4 11	349·6	365	6,851·5	372·45
Mature.						
Stirling June ..	J. A. Moffat, Turiwiri	7 90	385·0	365	13,306·0	761·38
Caledonia Flora* ..	W. P. Begg, Arapohue	8 57	385·0	365	12,919·4	758·70
Clarion's Mystery ..	Mrs. R. Comber, Tauranga	6 49	385·0	365	11,633·7	640·11
Bretton Diamond ..	A. C. Smith, Hamilton	6 24	385·0	365	10,234·5	615·76
Bride's Waif ..	A. E. Sly, Whakaronga	10 349	385·0	364	10,051·1	564·52
Maori Proper ..	G. Hewitt, Waimana	9 308	385·0	292	10,668·7	541·85
Jersey Meadows Onyx	Mrs. E. M. Hardy, Wanganui	8 6	385·0	365	8,671·2	527·16
Awa Good Nymph ..	A. J. Blake, Waipawa	10 307	385·0	305	8,617·5	517·25
Sybil Monopoly's Sunlight	K. G. Poulgrain, Manutuke	5 325	385·0	298	8,119·9	509·91
Cokeley Whisper ..	F. C. Ross, Feilding	5 247	385·0	365	9,554·6	505·14
Ebors Alma ..	R. J. Wilson, Putaruru	5 3	385·0	305	11,103·5	456·50
Fern Dell Welcome ..	K. A. Bennett, Te Puke	13 282	385·0	285	7,797·9	404·98
Ebors Lady Mystery	R. J. Wilson, Putaruru	8 5	385·0	269	7,988·0	404·64
Ebors Gertie ..	Ditto ..	5 35	385·0	179	7,982·8	399·53

Milking Shorthorn.

Mature.							
Woodbine Fair Rosamund	W. M. Barnett, Tai Tapu	5	302	385·0	365	14,667·9	639·00
Waimea Isobel ..	W. McGowan, Waiuku	10	204	385·0	365	14,060·0	617·72
Waimea Primrose ..	R. Hooper, Waikanae	5	242	385·0	365	12,346·0	528·66

SECOND CLASS.

Jersey.

Three-year-old.							
Hatcliffe Briar Berry	T. H. Gooch, Huinga, Stratford	3	345	346·5	365	13,055·1	718·56

*This cow also qualified for a certificate in the 305-day class.

305-DAY DIVISION.

Jersey.

Name of Cow and Class.	Tested by	Age at Start of Test.	Fat required for Certificate.	Yield for Season.		
				Days.	Milk.	Fat.
		Yrs. dys	lb.		lb.	lb.
Junior Two-year-old.						
Selbourne Gaiety ..	O. C. Sutton and Sons, Richmond, Nelson	2 13	251·8	305	7,399·2	477·03
Selbourne Janet ..	Ditto ..	2 58	256·3	305	7,536·8	407·54
Little Rebel ..	J. D. Lilburn, Hunterville	1 327	250·5	305	6,874·2	364·69
Selbourne Janie ..	O. C. Sutton and Sons, Richmond	2 70	257·5	305	6,288·7	363·24
Clifton Golden Bess ..	A. F. and A. Jagger, Karaka, Papakura	2 44	254·9	249	5,939·6	351·30
Senior Two-year-old.						
Clifton Eileen ..	Ditto ..	2 355	286·0	255	6,583·2	379·67
Clifton Sunbeam ..	,, ..	2 364	286·9	249	7,930·8	307·71
Three-year-old.						
Woodstock Maple Leaf	J. D. Lilburn, Hunterville	3 23	289·3	305	7,180·2	459·42
Clifton Sunray ..	A. F. and A. Jagger, Karaka, Papakura	3 313	318·3	270	8,161·3	452·34
Drysdale Dulcie ..	J. D. Lilburn, Hunterville	3 13	288·3	296	6,847·0	428·93
Princess Ethelreda ..	S. Dale, Hamilton	3 364	323·4	305	7,100·3	357·02
Mature.						
Caledonia Flora ..	W. P. Begg, Arapohue	8 57	360·0	305	11,432·2	657·43
Royal Oak Gertie ..	A. J. Hale, Hillsborough, N.P.	7 103	360·0	304	7,077·3	512·25
Hua Brook Myra ..	J. T. Herbert, Gisborne	7 311	360·0	305	8,502·2	494·00
Conandale Kitty's Winner	S. Dale, Hamilton	5 360	360·0	305	6,491·9	380·55
Haywoods Achievement	A. D. Brough, Mangapiko	9 53	360·0	267	6,695·8	376·70

SECOND CLASS.

Jersey.

Junior Two-year-old.							
Selbourne Fairy Fay	O. C. Sutton and Sons, Richmond, Nelson	1	350	250·5	305	7,259·6	414·36
Mature.							
Ebors Lady Frances ..	R. J. Wilson, Putaruru	7	7	360·0	305	11,251·0	623·89
Bushmere Cheeky ..	J. T. Herbert, Gisborne	5	9	360·0	305	7,243·3	404·67

Effect of Stripping-appliances.

A CORRESPONDENT, H. J. (Te Awamutu) writes: Could you express any opinion as to what effect the various stripping-appliances now being sold with many milking-machines would be likely to have on cows' udders? The vacuum actually on the cows is apparently much lower, but, on the other hand, the cups have to remain on longer. Would this be likely to bring on latent mammitis?

In reply, the Live-stock Division states: The stripping-appliances being recommended and being sold with many milking-machines will quite probably fill a useful purpose if they are used with care. It is possible that the appliances will effectively do the stripping, and, provided care is exercised, there should be no more damage to the teats and udder than occurs with hand-stripping. The reduced vacuum may not do the stripping properly in a few cases, even though the cups are left on a longer time, and from this point of view the appliances may not prove satisfactory, unstripped cows being probably more subject to mammitis.

The main danger, however, to be guarded against when using any mechanical stripper is the possibility of the machine operating after all the milk has been withdrawn from the udder. Hence the care necessary to see that this does not occur. Danger is more likely to arise from the abuse of any mechanical stripper than from its careful use. With hand-stripping no abuse can possibly take place and longer time can be devoted to the cows which are difficult to milk and strip.

The effect of leaving a machine operate on an empty quarter with no milk flowing, even though under a reduced vacuum, would be to injure the teat and quarter and render the quarter more susceptible to mammitis.

✤ ✤ ✤

Pasture Establishment and Maintenance.

Improving the Quality of the Soil.

P. S. Syme, Instructor in Agriculture, Warkworth.

THE past few years have witnessed a silent but momentous revolution in grassland farming, and it may safely be said that the future holds almost boundless possibilities for still further increasing the production from New Zealand's pastures. It was at one time firmly believed that a high-class permanent pasture could profitably be established and maintained only on land which was specially adapted by Nature and further improved by man for the growing of grass, as typified by the much vaunted fattening pastures found in certain districts in England. Those considered a few years ago to be ideal pastures would to-day be regarded as only second rate throughout the greater part of New Zealand.

With the knowledge and experience of pasture establishment and management now so freely available, it can be asserted that the quality of the sward frequently depends more on the farmer than on the land. This statement can readily be confirmed by the numerous examples of an excellent pasture, separated from what can best be described as a mere aggregation of weeds, by only a boundary fence. The soil type is the same throughout and the climate is similar, but the men are different.

> The quality of a sward frequently depends more on the farmer than on the land, as is instanced by numerous examples. Throughout the whole life of a pasture proper management is important, but it should begin before the pasture is sown. A number of suggested seed mixtures suitable for various types of soil are given at the conclusion of the article.

Proper Management.

It is interesting to note how first-rate pastures have been established on widely differing types of soil. The light pumice lands of the central plateau and the heavy gumland clays of the North differing as they do in all material characters, are alike in this respect: both can be made to carry an excellent sward of grass, and, for both, correct management is the vital factor.

Proper management is important throughout the whole life of a pasture, and experience has shown that this may, in a comparatively short time, effect a remarkable transformation in the carrying-capacity; but if the best results are to be obtained good management should begin before the pasture is sown. The ultimate success of a pasture is very largely dependent on its good and speedy establishment, and this can only be obtained on a properly prepared seed-bed.

On the heavy gumland clays particular care is necessary, and every effort should be made to enlist the weather as an ally in the breaking down and pulverizing of the soil to produce the required tilth. This involves early ploughing in April or May, working the soil occasionally as the weather permits until late spring, when the land should again be ploughed and finally worked down ready for an early sowing towards the end of February.

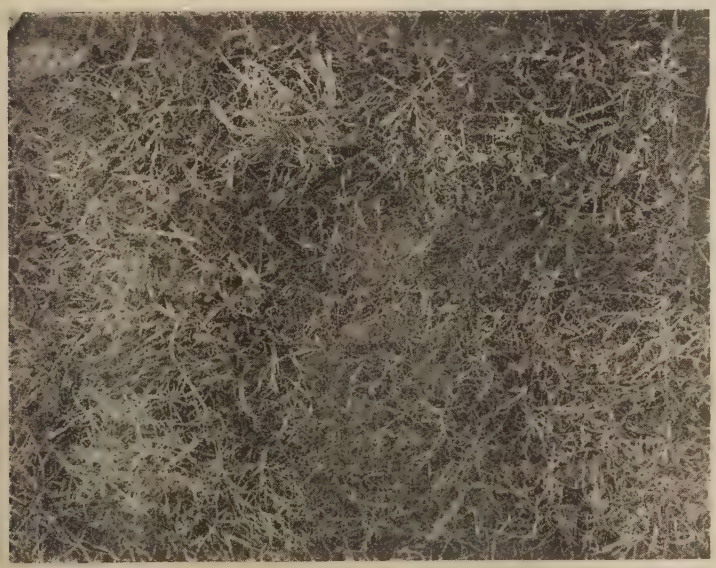

Fig. 1.—Showing the failure of clover due to the lack of proper consolidation at the time of sowing. Note the poor, unthrifty appearance of the grass.

Consolidation.

In districts where the soils are freer and easier to work a somewhat different treatment is desirable. Here consolidation is of the utmost importance, and the roller should be given pride of place in promoting conditions for successful establishment. A good tilth is invariably a prime necessity where small seeds are sown, and the importance of this is frequently better appreciated than the need for consolidation. On light, loosely-worked soils clovers do not readily establish, and without speedy clover establishment the pasture is foredoomed to complete failure, or, at best, only moderate success. When ploughing old turf or dirty land the value of a skim coulter can scarcely be exaggerated, and failure to use this is a very frequent explanation of the rapid re-establishment of twitches and other weeds between the furrow slices.

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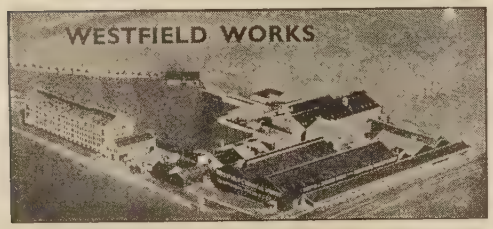

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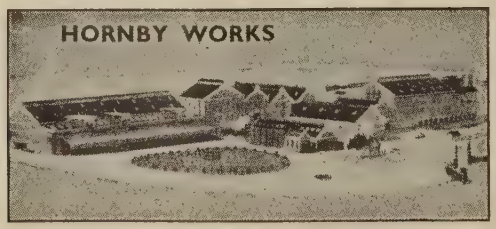
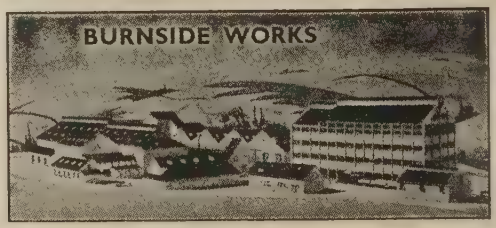


IN THE SOUTH ISLAND

"ROCKLAND"
BRAND



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Time of Sowing.

While the heavier soils are best worked down for autumn-sowing, the lighter soils can frequently be brought into good order for spring-sowing. If, however, the land is badly infested with weed seeds, or if the sowing has been unduly delayed, it may best be deferred until the autumn. This will allow an opportunity to fallow and clean the ground or to take a crop of soft turnips, and will still provide sufficient time to prepare the land for sowing the grass in late February or March.

Importance of Good Seeds.

Most farmers are now fully aware of the valuable work which has been done in seed certification and appreciate the value of pedigree and performance in their seeds no less than in their flocks and herds. The additional cost of good seed increases the total cost of the crop by only a trifling percentage; it can, however, increase the resulting production by several hundred per cent. It cannot be too strongly emphasized that inferior seed can never be cheap, and that many of the pastures seen to-day are second rate only because of false economy in the past.

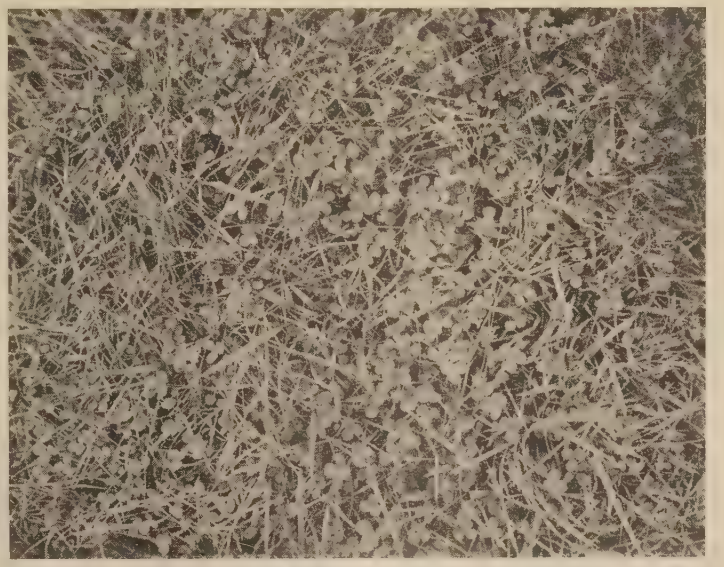

Fig. 2.—The seeds mixture and manurial treatment were the same as in Fig. 1, but this area was well consolidated. Note the dense clover establishment and the greatly increased vigour of the grasses.

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F. T. F. EVANS & CO. Evona Implement Works, Auckland, C.1, Sole Makers

The Mixture.

It has frequently been remarked that in many dairying districts, regardless of other species included in a mixture, the sward under good grazing management ultimately becomes rye-grass - white clover dominant. While admitting that this statement is frequently correct, good dairying pastures will frequently be found in which other species, such as cocksfoot, timothy, and meadow foxtail, play a very useful part, and on land where these are known to succeed they should certainly be included in the mixture sown.

Although it may be contended that on good land the pasture to aim for is predominantly rye-grass and white clover, even the best-aimed arrow may sometimes be deflected from its mark, and because of the risk of some fault in management resulting in poor establishment, smothering of clovers or a fall in fertility it may sometimes be wise, on the second-rate soils at any rate, to include also species which, while less valuable, are easier to establish, or which readily succeed on soils of lower fertility.

This is particularly important in regard to the clovers, on the establishment of which the success of the pasture must depend, and it affords some justification for the inclusion of alsike, subterranean clover, or *Lotus major*. The additional cost of those seeds may be regarded in some measure as an insurance premium, to be paid where it is not definitely known that rye-grass and white clover are certain to establish and can be relied upon to hold their ground.

PUBLIC NOTICE

DENIAL OF RUMOUR

The Mineral Supply Company Ltd. hereby desires emphatically to deny the current rumour that their product "WONDER" MINERAL FOOD contains no COBALT. In effect, this food contains COBALT as recommended by the Cawthron Institute, and was one of the first licks on the market to contain this valuable health-giving ingredient.

WONDER MINERAL STOCK FOOD

Distributed by THE WONDER DISTRIBUTORS LTD. MACARTHUR ST. FEILDING

FOR THE MANUFACTURERS MINERAL SUPPLY CO. LTD.
88 PRINCESS ST., PALMERSTON NORTH
and also 285 ST. ASAPH ST., CHRISTCHURCH

Suggested Mixtures.

The following mixtures are suggested as suitable, with slight modifications for the general range of dairying country, and may serve as a useful guide :—

Permanent Pasture for Soils of High Fertility.

	lb.
Certified perennial rye grass	25
Certified cocksfoot	10
Crested dogstail	2
Certified Montgomery red clover	2
Certified white clover	2
	41

Permanent Pasture Mixture for Rich Moist Soils.

	lb.
Certified perennial rye-grass	15
Certified cocksfoot	8
Timothy	4
Certified Italian rye-grass	5
Meadow foxtail	4
Poa trivialis	2
Certified Montgomery red clover	2
Alsike	2
Certified white clover	2
	44

Mixture for Gumland Soils.

	lb
Perennial rye-grass (certified)	20–25
Paspalum (Australian)	6
Crested dogstail	2
White clover (certified)	2
Red clover	2
Lotus major (colonial)	1
Certified New Zealand cocksfoot*	7
	40–46

*May omit and sow 25 lb. perennial rye-grass.

Mixture for Paspalum-ryegrass-white clover Sward on Moist Soils.

	lb
Certified perennial rye-grass	15
Certified New Zealand cocksfoot	5
Paspalum	8
Certified Italian rye-grass	5
Timothy	2
Red clover (certified Montgomery)	2
Alsike	2
Certified white clover	2
	41

Pumice Land P.P. Mixture.

	lb
Certified perennial rye-grass	25
Certified New Zealand cocksfoot	8
Crested dogstail	3
Certified white clover	2
Certified Montgomery red clover	2
	40

Mixture for Peat Soil (Unconsolidated).

	lb.
Perennial rye-grass (certified)	10
Yorkshire fog	6
Certified Italian rye-grass	6
Paspalum	5
Brown-top	1
Lotus major	2
	30

(To be continued.)

On the fertile Coal Creek flats outside Greymouth dairymen are faced with the problem of keeping down white clover to obviate bloat danger in the spring. One farmer has adopted a policy of very light winter grazing (one hour per day) in selected paddocks, following autumn top-dressing with ammoniated super. These now show a 6 in. to 8 in. growth of rye, timothy, and cocksfoot, with no likelihood of white-clover growth.

Lambing Estimates for 1938.

Decrease of 4 per Cent. in Dominion Totals.

Contributed by the Live-stock Division.

THE annual lambing estimates have in the past provided a reasonably accurate forecast of the seasonal lambing, but in view of the incidence of so-called facial eczema this will not be the case this year.

The estimated number of lambs is based on the number of breeding-ewes in each county as at the 30th April, and although in the estimated *percentage* of lambs due allowance has been made for the effects of facial eczema it has not been possible to make any adjustment for losses of breeding-ewes subsequent to the 30th April last because of the varying duration and severity of the epidemic in different districts.

The figures for the Auckland Province and, to a lesser extent, the Wellington district in Taranaki and Manawatu are therefore likely to prove inaccurate and unduly optimistic.

County.	Breeding-ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
Auckland District.			
Mangonui	32,146	65·00	20,894
Whangaroa	12,940	63·25	8,185
Hokianga	61,461	68·37	42,021
Bay of Islands	54,465	65·30	35,566
Hobson	70,506	65·70	46,322
Otamatea	68,529	71·26	48,834
Whangarei	103,736	72·84	75,561
Rodney	72,216	71·21	51,425
Waitemata	69,001	69·65	48,059
Great Barrier	7,595	53·22	4,042
Eden	2,467	83·69	2,064
Manukau	60,058	68·00	40,839
Franklin	88,747	56·00	49,698
Raglan	266,774	72·96	194,638
Waikato	93,243	60·95	56,831
Waipa	147,240	66·98	98,621
Piako	103,485	56·29	58,251
Waitomo	269,511	65·00	175,182
Kawhia	54,666	63·00	34,440
Otorohanga	99,774	62·00	61,860
Ohura	92,021	73·50	67,635
Kaitieke	53,738	76·60	41,163
Taumarunui	83,219	68·30	56,838
Coromandel	39,979	64·60	25,826
Thames	10,864	76·30	8,289
Hauraki Plains	9,029	73·28	6,616
Ohinemuri	11,674	74·18	8,660
Matamata	142,691	63·33	90,366
Tauranga	66,920	71·50	47,848
Whakatane	35,235	73·12	25,763
Opotiki	49,110	74·00	36,341
Rotorua	56,774	88·00	49,961
Taupo	8,017	89·00	7,135
Totals	2,397,831	67·80	1,625,774
Gisborne-Hawke's Bay District.			
Waiapu	252,080	73·00	184,018
Cook	468,491	83·00	388,475
Waikohu	372,004	78·00	290,163
Matakaoa	62,646	75·00	46,985
Uawa	125,296	82·00	102,743
Wairoa	388,721	72·00	279,879
Hawke's Bay	915,129	78·00	713,800
Waipawa	353,072	86·00	303,642
Waipukurau	125,706	90·00	113,135
Patangata	482,109	81·00	390,508
Weber	54,258	90·00	48,832
Dannevirke	239,688	97·00	232,497
Woodville	72,114	90·00	64,903
Pahiatua	144,998	90·00	130,498
Akitio	154,565	89·00	137,563
Totals	4,210,877	81·39	3,427,641
Wellington District.			
Clifton	62,461	78·00	48,720
Taranaki	21,124	93·00	19,645
Inglewood	36,203	85·00	30,773
Egmont	22,134	84·00	18,593
Stratford	70,915	76·00	53,895
Whangamomona	47,714	77·00	36,740
Eltham	47,759	89·00	42,506
Hawera	76,042	86·00	65,396
Waimate West	3,965	91·00	3,608
Patea	202,174	91·00	183,978
Waitotara	140,205	82·00	114,968
Waimarino	162,285	82·00	133,074
Wanganui	286,628	79·00	226,436
Rangitikei	920,716	91·00	837,852
Oroua	192,794	98·00	188,938
Kairanga	101,314	90·00	91,183
Kiwitea	211,294	89·00	188,052
Pohangina	110,868	93·00	103,107
Manawatu	129,500	89·00	115,255
Horowhenua	110,865	77·00	85,366
Hutt	75,833	76·00	57,633
Makara	48,378	84·00	40,638
Featherston	317,041	85·00	269,485
South Wairarapa	158,014	87·00	137,472
Masterton	321,108	80·00	256,886
Castlepoint	95,722	80·00	76,578
Eketahuna	111,426	79·00	88,027
Mauriceville	42,639	76·00	32,406
Totals	4,127,121	85·94	3,547,210

Marlborough - Nelson - Westland District.

County.	Breeding-ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
Waimea	170,120	75·67	128,729
Takaka	27,500	76·82	21,125
Collingwood	13,293	77·03	10,239
Buller	3,040	84·00	2,553
Inangahua	11,198	101·00	11,309
Murchison	33,920	75·00	25,440
Grey	24,553	97·00	23,816
Westland	38,050	102·00	38,811
Sounds	100,732	77·51	78,077
Marlborough	203,962	82·48	168,227
Awatere	209,849	89·18	187,143
Totals	836,217	83·16	695,469

Canterbury - Kaikoura District.

Kaikoura	114,511	81·00	92,753
Amuri	236,873	73·00	172,917
Cheviot	148,424	91·00	135,065
Waipara	292,082	84·00	245,348
Ashley	66,655	82·00	54,657
Kowai	68,930	95·00	65,483
Oxford	82,104	91·00	74,714
Rangiora	38,651	96·00	37,104
Eyre	58,325	92·00	53,659
Tawera	58,524	83·00	48,574
Malvern	130,321	88·00	114,682
Paparua	31,418	96·00	30,161
Waimairi	4,116	97·00	3,925
Heathcote	10,666	92·00	9,812
Akaroa	101,288	104·00	105,339
Mt. Herbert	43,974	95·00	41,775
Wairewa	74,977	99·00	74,227
Halswell	14,020	89·00	12,477
Springs	30,316	103·00	31,222
Ellesmere	92,843	114·00	105,841
Selwyn	162,065	87·00	140,996
Ashburton	769,914	93·00	716,020
Geraldine	255,103	84·00	214,286
Levels	168,372	115·00	193,627
Mackenzie	323,760	84·00	271,958
Waimate	462,593	97·00	448,715
Chatham Islands ..	43,768	73·00	31,950
Totals	3,884,593	90·80	3,527,287

Otago District.

Waitaki	451,158	89·00	401,530
Maniototo	249,689	83·00	207,241
Vincent	257,036	84·00	215,910
Waihemo	105,076	87·00	91,416
Waikouaiti	68,283	97·00	66,234
Taieri	170,488	86·00	146,619
Peninsula	13,081	98·00	12,819
Clutha	360,010	95·00	342,009
Tuapeka	303,453	90·00	273,107
Bruce	210,686	87·00	183,296
Lake	136,625	78·00	106,567
Southland	1,358,859	101·00	1,372,447
Wallace	521,196	77·00	401,320
Stewart Island	1,587	80·00	1,269
Totals	4,207,227	90·83	3,821,784

District Totals.

County.	Breeding-ewes.	Estimated Percentage of Lambs.	Estimated Number of Lambs.
Marlborough	836,217	83·16	695,469
Canterbury	3,884,593	90·80	3,527,287
Otago	4,207,227	90·83	3,821,784
South Island ..	8,928,037	90·10	8,044,540
North Island ..	10,735,829	80·11	8,600,625
Dominion ..	19,663,866	84·64	16,645,165

District Estimates.

The following table gives the estimates of the current (1938) season's lambing for the several sheep districts :—

District.	Number of Breeding-ewes.	Estimated Average Percentage of Lambing.	Estimated Number of Lambs.
Auckland	2,397,831	67·80	1,625,774
Gisborne-Hawke's Bay ..	4,210,877	81·39	3,427,641
Wellington-West Coast ..	4,127,121	85·94	3,547,210
Marlborough - Nelson - Westland	836,217	83·16	695,469
Canterbury-Kaikoura ..	3,884,593	90·80	3,527,287
Otago-Southland ..	4,207,227	90·83	3,821,784
Dominion ..	19,663,866	84·64	16,645,165

Year.	Number of Breeding-ewes.	Estimated Average Percentage of Lambing.	Estimated Number of Lambs.	Actual Number of Lambs tailed.
North Island.				
1938 ..	10,735,829	80·11	8,600,625	..
1937 ..	10,570,388	86·52	9,145,849	9,401,496
1936 ..	10,300,826	90·50	9,322,476	9,423,240
1935 ..	9,697,231	83·68	8,114,361	8,500,075
1934 ..	9,524,065	88·70	8,447,643	8,555,477
1933 ..	9,318,943	91·23	8,502,050	8,385,569
South Island.				
1938 ..	8,928,037	90·10	8,044,540	..
1937 ..	8,761,689	91·35	8,003,668	7,939,418
1936 ..	8,368,135	90·10	7,539,576	7,442,781
1935 ..	8,115,186	89·45	7,259,281	7,196,542
1934 ..	8,047,361	89·88	7,232,750	7,134,015
1933 ..	7,890,756	88·14	6,955,252	6,889,128
Dominion.				
1938 ..	19,663,866	84·64	16,645,165	..
1937 ..	19,332,077	88·71	17,149,517	17,340,914
1936 ..	18,668,961	90·32	16,862,052	16,866,021
1935 ..	17,812,417	86·31	15,373,642	15,696,617
1934 ..	17,571,426	89·24	15,680,398	15,689,492
1933 ..	17,209,697	89·82	15,457,302	15,274,697

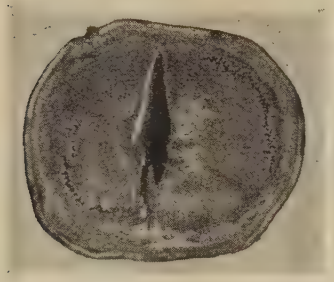


Fig. 1.—A very severe case in which small cracks have occurred marking the outer limits of the diseased zone.

Brown-heart in Swedes.

Trials with Application of Borax.

C. S. Dalgliesh, Fields Instructor, Rotorua.

Trials conducted by the Department of Agriculture show that the application of borax affords a large measure of control of brown-heart in swedes. It is emphasized, however, that the safe method is to broadcast the borax before sowing, and not to allow it to come into close contact with the seed.

IN common with quite a number of districts throughout New Zealand, brown-heart has been prevalent for a number of years in swede crops of the South Auckland Land District.

Unfortunately, as far as is known, there is no means of detecting superficially the presence of brown-heart in the average swede crop, as, in general, the crop appears normal and healthy, and only when bulbs are cut is brown-heart detected. Instances occur in which swedes are rough in the skin and irregular in shape and show an extensive degree of the disease when examined by cutting, but it is only occasionally that one meets with such conditions and is able to state from observation only that brown-heart is prevalent.

Signs of Disease.

A bulb affected with brown-heart shows a clearly defined zone mottled with brownish areas, and not arranged to any definite pattern (Fig. 2). In the case of slight attack the area involved may be merely a small patch or arc of tissue. In very severe cases small cracks occur, marking the outer limits of the diseased zone (Fig. 1). The trouble in swedes only slightly affected is often confused with frost injury, and it is not easy to recognize slightly infected bulbs after they have been exposed to a severe frost.

In general, however, it may be said that brown-heart mottling can be recognized by its presence in a ring around the centre of the bulb and its absence in the marginal zone. Frost, on the other hand, always affects the outside first. That there is no connection between the two types of injury is clearly shown on cutting swedes before frosts have set in, when the trouble may be found to be fairly extensive.

Feeding Value Reduced.

Although there is no actual loss in bulk, the feeding-value of a brown-heart-affected crop is markedly decreased. An analysis carried out in Scotland showed an increase of approximately 2 per cent. in the fibre content of the diseased swedes, accompanied by a decrease of from 3 per cent. to 4 per cent. in the soluble carbohydrates. The amount of sugar in the juice may be reduced by as much as 12 per cent. These changes, taken altogether, result in a serious reduction in the feeding-value. If affected swedes are boiled for human consumption they remain hard, stringy, and tasteless.

It was thought that the cause of brown-heart was due to acidity of the soil. In experimental trials conducted in New Zealand in which special attention was given to thorough cultivation, liming, and manurial treatment no definite improvement was obtained. Where farmyard manure was used, and on situations where haystacks had been built, swedes were invariably found to be more or less free from brown-heart. Great Britain and New Zealand investigational results concur in this respect. Hurst, Dominion Botanist, Canada, showed by pot test trials that it took about 30 tons of well-rotted farmyard manure per acre to eliminate the disease completely.

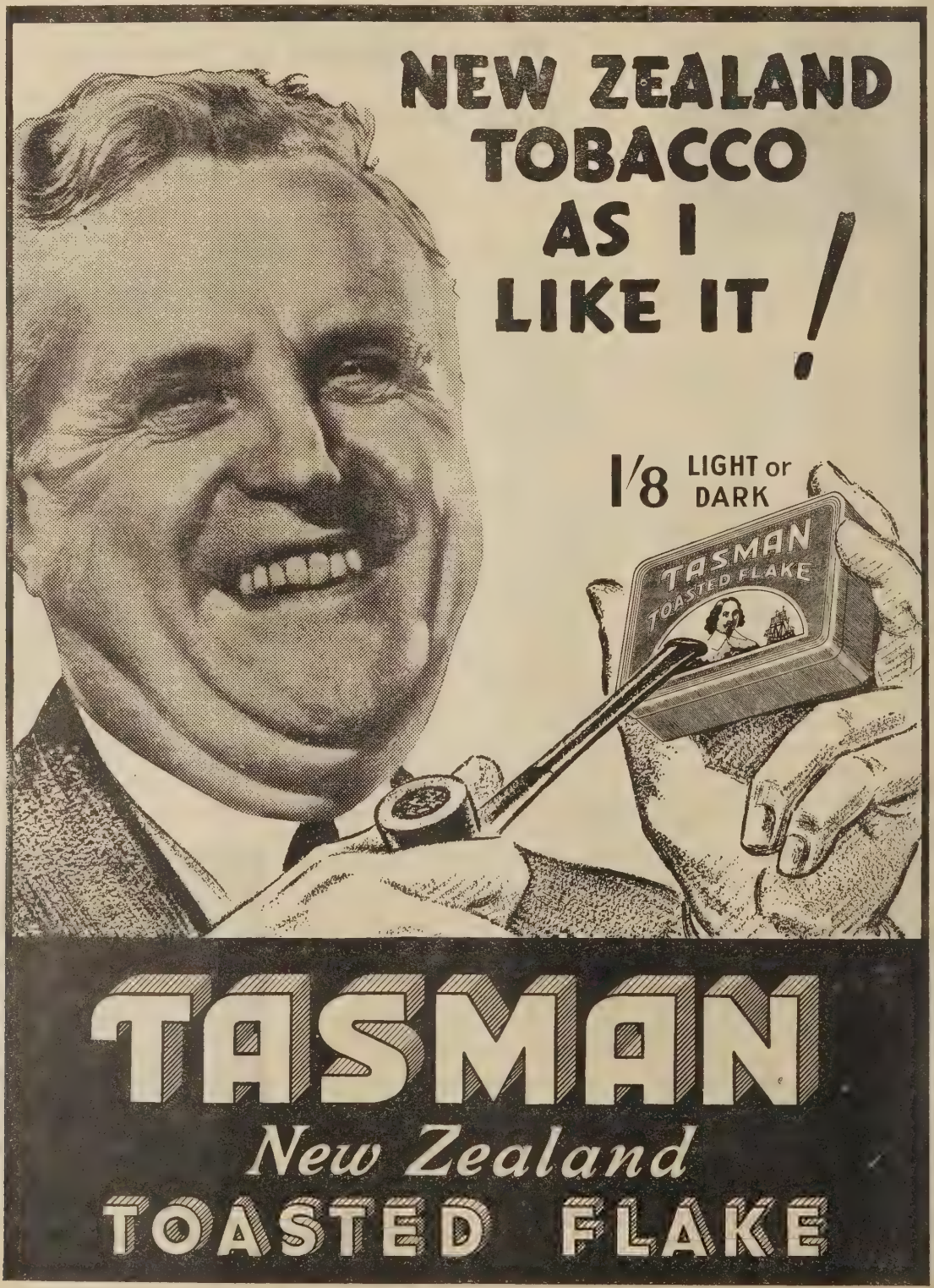
Effects of Liming.

The effects of a free use of lime proved disappointing in New Zealand, as such did not overcome the trouble. Similarly, in the west of Scotland it was a common experience in farming practice to find that a heavily limed field yielded a high percentage of brown-heart-infected swedes. Scientific-research workers in Great Britain and Canada formed the opinion, after much detailed research, that the disease was due to a deficiency of the element-boron—"Boron never occurs free as an element, but in combination usually as boracic (boric) acid and in several minerals, such as crude borax." This led to experimental trials being conducted by broadcasting borax at the rate of 20 lb. per acre on the land prior to the sowing of swedes. Results were a good all-round improvement, with complete control in several trials.

In the 1935–36 season the Department of Agriculture carried out several trials throughout New Zealand with applications of borax on swede crops to gain information of its use as a means of control of brown-heart on New Zealand soils.

The treatment consisted of mixing 10 lb. per acre of borax with sufficient fertilizer to sow an acre, the treated area being compared with the farmer's crop alongside in which the same manurial treatment was given but no borax added. In the majority of the trials satisfactory control of the disease was obtained by the use of borax, but in some trials detrimental effects in germination was noted. For detailed particulars, see the *Journal of Agriculture*, Vol. 53, August, 1936, page 99.

Fig. 2.—A typical case of brown heart in swedes.


NEW ZEALAND
TOBACCO
AS I
LIKE IT !
1/8 LIGHT or DARK
TASMAN
TOASTED FLAKE
TASMAN
New Zealand
TOASTED FLAKE

Mixing with the Fertilizer.

In the sowing of turnips and swedes in the North Island most farmers adopt the method of mixing the seed with the fertilizer. Experience now gained in the use of borax clearly shows that when the seed comes in close contact with borax, as is the case when seed, fertilizer, and borax are all mixed together, detrimental effects to germination is very likely to occur. Two trials were conducted in the Rotorua district in the 1935–36 season. Germination and control of brown-heart was very satisfactory in both crops where borax was used, and in the main crops on both farms where the trials were carried out brown-heart was much in evidence.

This led to a free use of borax in the 1936–37 season by farmers of the district. A number of farmers purchased borated fertilizers manufactured by proprietary firms; others purchased borax and mixed it with the fertilizer, using it at the rate of 2½ lb. to 3 lb. per 100 lb. of fertilizer. Germination suffered severely in many crops, but control of brown-heart was entirely satisfactory. In this same season the Department of Agriculture conducted further trials with borax at rates of 3 lb., 6 lb., 9 lb., and 12 lb. per acre, the respective quantities being mixed with 3 cwt. of basic superphosphate per acre and seed.

Further Trials.

In addition, trials with applications of borax at 10 lb. per acre broadcast on the land prior to sowing, and also in top-dressing the crop, were carried out. Five trials were conducted in the Rotorua-Putaruru district, and in four the mixing of seed, fertilizer, and borax proved extensively detrimental to germination. Borax applied even as low as 3 lb. per acre did much damage when mixed with fertilizer and seed. The method of applying borax by broadcasting on the land prior to sowing did not result in any harmful results to germination.

All applications of borax—3 lb., 6 lb., 9 lb., and 12 lb. per acre mixed with fertilizer and seed, and applications by broadcasting and top-dressing—gave very satisfactory results in the control of brown-heart. This was particularly outstanding in a crop in the Reporoa district, where the incidence of brown-heart on areas not treated with borax was very pronounced.

During the 1937–38 season trials were confined to borax broadcast on the land previous to the sowing of the swede crop at rates of 10 lb., 15 lb., 20 lb., and 30 lb. per acre. No detrimental effects to seed germination occurred, and complete success in the control of brown-heart was secured. In most crops the swedes were more healthy in appearance—fresher tops and cleaner in the skin—on borax-treated areas than on untreated plots, as shown in the illustrations.

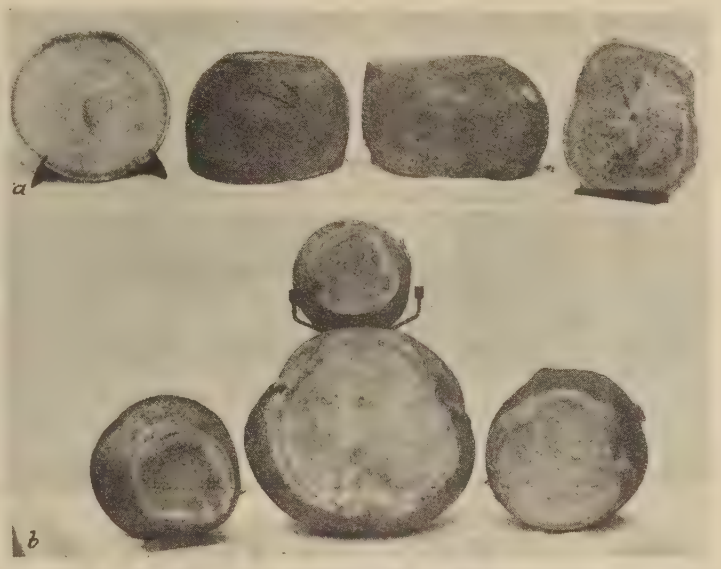


Fig. 3.—(a) Left: Two swedes clean in skin and free from brown heart taken from area on which 15 lb. of borax was applied by broadcasting prior to sowing. Right: Two swedes rough in skin with fairly extensive brown heart from an area where borax treatment was not given. (b) Left: Two swedes from an area without borax treatment. Although they are clean in skin, extensive brown heart is clearly shown. Right: Two swedes free from brown heart from an area treated with 10 lb. of borax per acre.

Liming not Recommended.

Applications of borax broadcast on the land at the rate of 15 lb. per acre prior to sowing gave an average increased weight of 5½ tons per acre over areas not treated. As lime applications appear to be incompatible with brown-heart control, liming immediately before sowing a swede crop is not recommended in districts where brown-heart is prevalent; nor should fertilizer mixtures including borax and containing free lime be used.

The method of applying borax alone by broadcasting is not practical for the farmer, but the trials conducted in the Rotorua-Putaruru area clearly showed that 10 lb. per acre of borax gave satisfactory results, and that up to 30 lb. per acre applied by broadcasting did not produce harmful effects to seed germination. It is therefore evident that the safe method is to apply borax before sowing and not to allow close contact with the seed.

The mixing of borax at the rate of 8 lb. per acre with 2 cwt. of fertilizer and the application of this to the land a few days before sowing, the seed being sown with 1 cwt. or more of fertilizer, is a reasonable measure to adopt, and has been adopted as a farming practice in this district with successful results.

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Efficient Orchard Ladders.

Construction of Best Types Described.

N. J. Adamson, District Supervisor, Nelson.

Orchard ladders, ranging in size to suit the height of the various types of trees grown, are a very necessary adjunct to an orchardist's equipment. Ladders are so much employed in orchards during pruning, fruit-thinning, and harvesting operations that it is essential for the efficient and economical carrying-out of these operations to have the best type of ladder procurable.

Essential Features.

The essential features of an orchard ladder are—

(1) Strength and durability;

Figs. 1, 2, and 3.—Ladders from 7 ft. to 14 ft. to suit the varying height of trees.

(2) Safety for operating on uneven surfaces;

(3) Lightness; and

(4) Ease of approach to a tree.

TWO CHEAP FARMS.

WHANGAREI DISTRICT.

110 acres, about 40 acres flat, balance undulating, when further improved will carry 45 cows besides other stock. 5-roomed house, ample out-buildings, 1½ miles from township. Price only £1,750 as a going concern, including 30 cows, horse, bull, 3-cow milking plant, &c. £700 deposit satisfactory.

HANDY TO HELENSVILLE.

112½ acres of rich flats, part requires further improvements, carry now 40 cows and could be made to carry 50 to 60 cows in a year or two. 4-roomed cottage, manure shed, 4-bail cow shed. Price only £2,200, including 20 cows, 3 heifers, 5 head dry stock, separator, &c. £500 deposit required.

Full particulars from Sole Agent:

JNO. GREY.

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Fig. 4.—A full range of ladders from 5 ft. to 7 ft.

The type of orchard ladder illustrated is one used to a very large extent in Hawke's Bay, where trees range in size from the rather squat, heavily-bearing Sturmer apples to the giant pear-trees which necessitate the use of 14 ft. ladders.

For lightness, dressed white pine is used in the construction, but is made durable by dressing with creosote. The legs, stays, and bottom brace are of 3 in. by 1 in. timber, while the remaining braces, rungs, and support are 2 in. by 1 in.

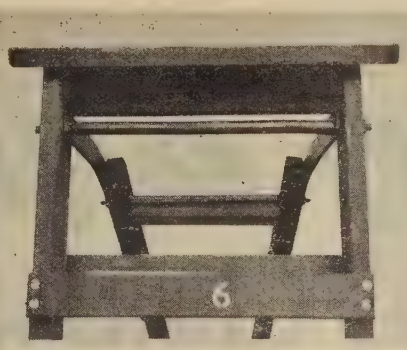

Fig. 5.—A 14 ft. ladder illustrating bent stays and clearance of legs from ground. The weight is taken by the stays, thus giving security on uneven ground.

Fig. 6.—Showing the fixing of brackets and the hinging of the support.

Fig. 7.—Showing the construction of the support, which has a centre-piece in long ladders to provide greater rigidity.

The top bolt, to which is hinged the metal bracket for attaching the support, is ⅜ in., and separating the metal brackets is a piece of gas-piping, through which the bolt passes. The remaining bolts are ¼ in. The timbers forming the support converge at 5 ft. to 7 ft. from the hinge according to the ladder height, and form a hinge-prop support.

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This type of support is strong, and may be placed close in to the tree-trunk without causing injury to horizontal branches, thus giving easy approach to the tree. The rungs, which are spaced to give a lift of approximately 11 in., are checked in on the front and flush at the back, and are fastened with 1¾ in. screws of No. 10 gauge.

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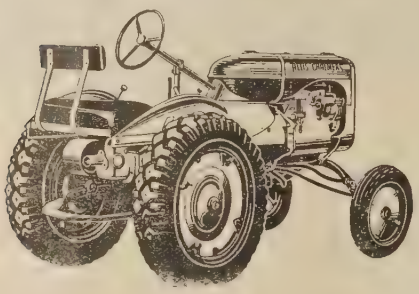

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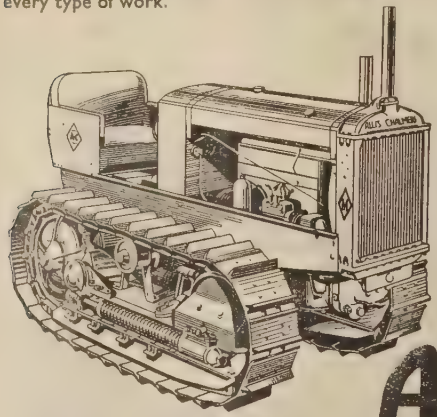

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M. J. SCOTT, Superintendent of the Pig Industry.

OF the 144 sows recorded during the quarter ended 30th November, 1938, eighty had litters sufficiently good to be included in one of the grades set out below :—

Grade.	Litter Weight.	
	At Three Weeks.	At Eight Weeks.
	lb.	lb.
1	120	360
2	100	300
3	90	270
4	80	240
5	70	210

In the following list the owner's name and address are given, followed by the herd-book number of the sow and the grade of litter produced :—

Berkshires.

Barnett, A. L., Leeston, 12557/4; Barnaby, F. J. P., Rongotea, 11143/4, 10718/5; Burmeister, O. P., Kairanga R.D., Palmerston North, 8528/5, 13211/5; Canterbury Agricultural College, Lincoln, 10487/4, 11888/4; Ellerm, O. C., Sanson R.D., Palmerston North, 12708/1; Kahungunu Pig Club (Rae Gilmore), Nuhaka, Wairoa, H.B., 12811/3; Larsen, O. C., R.D., Umutaoroa, 11817/1, 12644/2; MacIndoe, C. G., Te Matai Road, Te Puke, 12372/2; Maungapapa Pig Club, Waharoa, 12792/2; McGill, Walter, and Son, Ngahape R.D., Te Kawa, 11982/3; Ohau Pig Club (W. R. B. Evans), Buller Road, Levin, 13207/2; Paengaroa Pig Club (H. Jones), R.M.D., Te Puke, 12834/2; Prole, W. G., Omokoroa, Tauranga, 10867/3; Rangitira Pig Club (G. D. Withers), Waipaoa, via Gisborne, 12598/3; Stewart and Kerr, Onewhero, 10306/4, 12048/5; Takaka Pig Club (W. J. E. Jenkins), Takaka, 12878/4; Te Poi Pig Club (G. L. Bellamy), Te Poi R.D., Matamata, 13652/3; Unwin, S., "Stoneycroft," Winchester, 10387/3; Waiomatatini School Pig Club (J. Walker), Waiomatatini, 13875/3; Western Drain Pig Club, care of J. E. Mussett, P.O. Box 12, Whakatane, 13408/5.

Large Blacks.

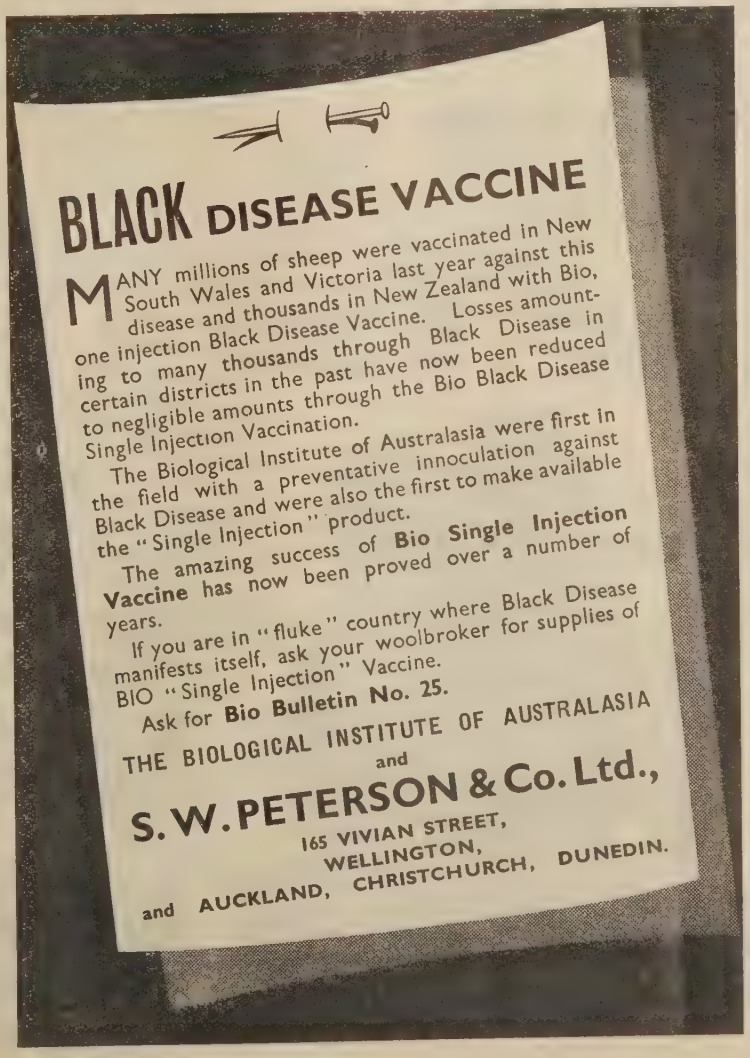
Ngongotaha Pig Club (K. M. Martin), P.O. Box 13, Ngongotaha, 1651/4; McGill, Walter, and Son, Ngahape, R.D., Te Kawa, 1554/4; Pedersen, N. P., Kauwhata P.O., Palmerston North, 1109/5; Rangiriri Pig Club (C. R. McCutchan), Rangiriri, 1739/2; Whitelock, G. M., Newbury R.D., Palmerston North, 1693/4, 1320/1, 1590/1.

Large Whites.

Barrytown-Punakaiki Pig Club (A. T. Richards), Barrytown, 4874/5; Candy Bros., Pokuru, Te Kawa, 4697/2; 4777/2; Paerata Pig Club (A. E. B. Richardson), Grey Street, Pukekohe, 4905/5; Williams, A. E., P.O. Box 19, Kaiapoi, 4437/3, 4164/2.

Tamworths.

Awanui Pig Club (M. H. Bird), Awanui, 9360/2; Brown, Geo., Puha, 9160/2; Dalefield Pig Club (W. Press), Dalefield,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The following table sets out the performance of each breed and the average of all sows recorded during the quarter :—

Breed.	Number of Sows.	Averages.					
		Number of Pigs.		Litter Weight.		Weight per Piglet.	
		Born.	Weaned	Three Weeks.	Eight Weeks.	Three Weeks.	Eight Weeks.
Berkshire ..	51	8·9	7·0	76·1	250·3	10·8	35·5
Large Black ..	12	8·5	6·4	81·6	255·9	12·7	39·8
Large White ..	10	10·3	7·4	79·8	263·6	10·7	35·6
Tamworth ..	71	8·3	6·8	78·0	251·6	11·3	36·6

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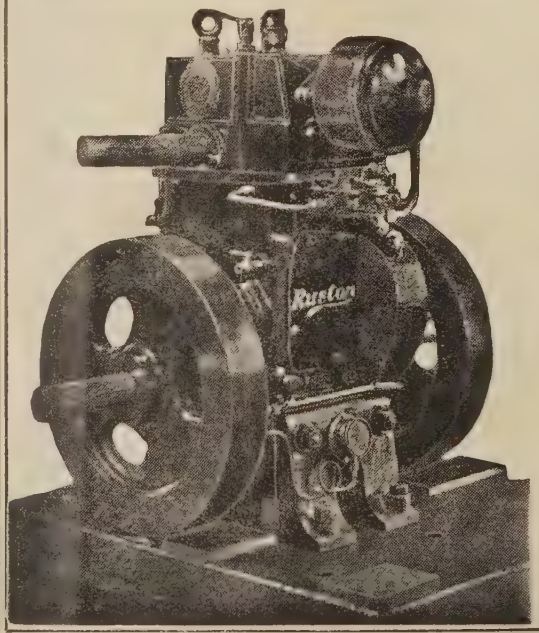

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Poultry-feeding Experiment.

Relative Merits for Egg-production.

W. L. JOURDAIN, Poultry Overseer, Wallaceville Poultry Station.

THE purpose of this experiment, which commenced on 1st April, 1937, and concluded on 2nd February, 1938—a total of forty-four weeks—was to determine the relative merits for egg-production of five different methods of feeding. The five methods were as follow :—

(1) Bran, pollard, and meat-meal mash ; meat-meal in an open hopper ; wheat, maize, and barley grain.
(2) Bran, pollard, and meat-meal mash ; wheat, maize, and barley grain.
(3) Soaked wheat.
(4) Soaked barley.
(5) Dry-mash and wheat as grain.

The two hundred pullets used were as uniform in size and type as possible, and were divided among five pens of the same dimensions, each pen housing forty pullets. All these pullets used were the same age, being hatched on the same day.

Oyster-shell and gravel grit were supplied freely, and green food in the form of young green oats and silver-beet was fed after the last feed at night, at about 4 p.m. This green food had been put through the chaffcutter before feeding.

The birds were fed twice a day, about 7 a.m. and again about 3.30 p.m. In addition, approximately 2 lb. of feed oats were scattered in each pen in the litter. This was fed for the purpose of making them work, and especially was this the case with Pens 3 and 4, which had all their food in troughs. The meat-meal fed to each pen was varied from 5 per cent. to 10 per cent. by measure according to the time of the year.

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Pen 1.

(Bran, pollard, and meat-meal mash, mixed grain, and meat-meal in an open hopper.)

The following are the mash and grain mixtures :—

Table 1.

Mash.

(By measure.)	lb.
2 parts pollard, weighing	32
1 part bran, weighing	9
5 per cent. to 10 per cent. meat-meal, weighing	4½–9
2 per cent. linseed-meal, weighing	1
Total	51

Grain.

	lb.
Wheat	60
Maize	20
Barley	20
Total	100

The meat-meal in the mash mixture was fed in addition to that in the open hopper. The birds in this pen ate nearly as much meat-meal from the hopper as they did in the mash. It is interesting to note that from April the amount of meat-meal consumed from the hopper steadily increased until the end of July. During August, however, there was a sharp drop of nearly 50 per cent., and from then until the end of November the amount consumed was approximately the same each month. Again, in December there was another sharp drop of 50 per cent. compared to November.

The monthly totals of meat-meal consumed are as follow :—

Table 2.

	lb.
April	18
May	20
June	26
July	29
August	16
September	18
October	15
November	17
December	8
January	9

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The extra meat-meal consumed did not result in extra egg-production, as this pen laid less eggs than Pen 2, which did not have the meat-meal before them.

Pen 2.

(Bran, pollard, and meat-meal mash and mixed grain.)

The following are the mash and grain mixtures :—

Table 3.

Mash.

(By measure.)	lb.
2 parts pollard, weighing	32
1 part bran, weighing	9
5 per cent. to 10 per cent. meat-meal, weighing	4½–9
2 per cent. linseed-meal, weighing	1
Total	51

Grain.	lb.
Wheat	60
Maize	20
Barley	20
Total	100

This pen was treated in exactly the same manner as Pen 1, with the exception of the additional meat-meal in Pen 1. The amount of food consumed by this pen was very nearly the same as Pen 1, there being a difference in favour of Pen 1 of approximately 200 lb., which was nearly the same as the extra meat-meal consumed from the hopper.

Pen 3.

(Soaked wheat.)

The amounts of food weighed each time were as follow :—

Table 4.

Bran Mixture.	lb.
Bran	17
Meat-meal	6
Linseed-meal	2
Total	25

	lb.
Bran	36
Wheat	100

The amount of meat-meal in this table is approximately 5 per cent. (by measure) of the wheat. This amount was varied between 5 per cent. and 10 per cent. according to the season.

The method adopted with this pen was the same as was done with the experiment conducted during 1936–37, and was as follows : The amount of wheat required for each meal was first soaked for twenty-four hours, and the water in which the wheat was soaked had approximately 1 per cent. of salt dissolved in it. For the morning meal the soaked wheat was dried off with the bran mixture (see Table 4), and for the evening meal it was dried off with plain bran and green-food. The amount of green food used was approximately one-third of the total mixture of bran, wheat, and green food.

The birds in this pen were brought on to this method of feeding more gradually than was done last year, and, as they were not laying when this was done, they did not go into a moult as the result. The birds were never ravenous for their food, and they had to be watched closely, as the amount of food consumed varied practically every day.

Pen 4.

(Soaked barley.)

The amounts of food weighed each time were as follow :—

Table 5.

Bran Mixture.	lb.
Bran	17
Meat-meal	6
Linseed-meal	2
Total	25

	lb.
Bran	36
Barley	100

The amount of meat-meal was varied between 5 per cent. and 10 per cent. by measure in the same manner as that in Pen 3. The same method of feeding and preparing the food was adopted with this pen as with Pen 3, with the exception that barley was substituted for the wheat.

While the cost of the feed consumed in this pen was nearly the same as that of Pen 3, this pen laid nearly seven hundred eggs less during the experiment. In common with the birds on soaked wheat, these birds were never very ravenous for their food. This may have been caused by the fact that the soaked barley was slightly fermented when fed to the birds. It was noticed right through the experiment that the soaked barley had a fermented and offensive smell. This was more noticeable during the summer months than at any other time.

Pen 5.

(Dry mash and wheat as grain at night.)

The food mixed for this pen was as follows :—

Table 6.

Dry Mash.	lb.
Maize-meal	50
Bran	16
Pollard	16
Meat-meal	4
Linseed-meal	4
Skim-milk powder	4
Boneflour	2
Salt	½
Total	96½

	lb.
Grain (wheat)	100

The amount of food consumed by this pen was considerably lower than the amount consumed by the dry-mash pen in the test for 1936–37. This year the pen also laid considerably fewer eggs; the difference being 109 dozen.

The following tables give—

(1) The costs and amounts of food consumed (Table 7).

(2) The number of eggs laid, and the amount received for them (Table 8).

(3) Net profit over cost of foods (Table 9).

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Table 7.—Quantities and Costs of Food Consumed.

Foodstuff.	Average Price.	Pen 1.		Pen 2.		Pen 3.		Pen 4.		Pen 5.	
		Quantity Used.	Cost.	Quantity Used.	Cost.	Quantity Used.	Cost.	Quantity Used.	Cost.	Quantity Used.	Cost.
		lb.	£ s. d.	lb.	£ s. d.	lb.	£ s. d.	lb.	£ s. d.	lb.	£ s. d
Wheat	6s. 10·5d. bushel	900	5 3 1	900	5 3 1	2,025	11 12 0	..	..	1,350	7 14 8
Maize	6s. 7·928d. bushel	300	1 15 9	300	1 15 9	..	..	..	..	..	..
Barley	5s. 10·166d. bushel	300	1 15 1	300	1 15 1	..	..	2,006	11 14 7	..	..
Oats	4s. 7d. bushel	511	2 18 7	511	2 18 7	511	2 18 7	511	2 18 7	511	2 18 7
Bran	£6 11s. 11·5d. ton	211	0 13 11	207	0 13 8	273	0 18 0	261	0 17 2	179	0 11 10
Pollard	£7 10s. 2·5d. ton	749	2 16 3	736	2 15 3	..	..	..	..	179	0 13 5
Maize-meal	£11 10s. ton	..	..	..	..	..	..	..	..	560	3 4 5
Meat-meal	£7 8s. 9d. ton	373	1 7 9	193	0 14 4	100	0 7 5	88	0 6 7	49	0 3 8
Linseed-meal	19s 6d. cwt.	24	0 4 2	23	0 4 0	20	0 3 6	18	0 3 2	45	0 7 10
Skim-milk powder	£2 17s. 2d. cwt.	..	..	..	..	..	..	..	..	45	1 3 0
Boneflour	11s. 6d. cwt.	..	..	..	..	..	..	..	..	22	0 2 4
Oyster-shell grit	5s. cwt.	120	0 5 4	112	0 5 0	106	0 4 9	109	0 4 10	107	0 4 9
Salt	1d. lb.	..	..	..	..	..	..	..	..	5	0 0 5
Total	..	..	16 19 11	..	16 4 9	..	16 4 5	..	16 4 11	..	17 4 11

Table 8.—Eggs Laid and Amount Received in Respect of Each Pen.

Month.	Average Price per Dozen.	Pen 1.		Pen 2.		Pen 3.		Pen 4.		Pen 5.	
		Dozen.	Value.	Dozen.	Value.	Dozen.	Value.	Dozen.	Value.	Dozen.	Value.
	s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.
April	2 0·483	10⅛	1 1 1	19⅛	1 19 1	11½	1 2 11	12⅜	1 5 10	15 7/12	1 11 10
May	2 4·358	35¼	4 3 1	38 7/12	4 11 2	43½	5 2 0	37½	4 7 10	35⅜	4 6 5
June	2 1·893	35¼	3 16 7	32¼	3 9 7	46¾	5 0 11	38½	4 3 8	38⅜	4 3 9
July	2 1·533	45⅜	4 17 2	47 7/12	5 2 0	40 7/12	4 7 1	45 1/12	4 15 11	34⅜	3 13 1
August	2 6·726	58⅛	4 11 8	60⅛	4 14 5	50 1/12	3 18 2	55⅛	4 6 4	45⅜	3 10 7
September	2 5·825	64½	4 15 7	64½	4 15 10	58 1/12	4 7 0	55 1/12	4 3 1	59 1/12	4 7 9
October	2 2·59	65⅜	3 19 10	70½	4 5 8	65	3 19 1	53 1/12	3 4 11	59⅜	3 12 9
November	1 4	60	4 0 0	61⅜	4 2 3	48⅜	3 5 1	38½	2 11 0	53⅜	3 11 7
December	1 4·782	58½	4 1 6	53 1/12	3 15 5	42 1/12	2 19 4	31½	2 3 7	46 1/12	3 4 11
January	1 3·337	42½	2 14 4	40	2 11 1	34½	2 4 6	20½	1 5 11	43 1/12	2 16 1
February	1 3·661	3 7/12	0 4 6	3 7/12	0 4 6	3	0 3 11	1 7/12	0 1 10	3⅜	0 4 5
Total	..	479 7/12	38 5 4	492½	39 11 0	444⅝	36 10 0	389 1/12	32 9 11	436	35 3 2

Table 9.—Net Profit over Cost of Food.

Pen No.	Average Cost per Dozen to Produce.	Number of Weeks.	Total Number of Eggs Laid and Sold.	Amount Received for Eggs.	Total Cost of Food.	Net Profit.	Average Number of Birds during Test.	Number of Birds at Start.
	d.		Dozen.	£ s. d.	£ s. d.	£ s. d.		
1	8·8½	44	479 7/12	38 5 4	16 19 11	21 5 5	38	40
2	8	44	492 7/12	39 11 0	16 4 9	23 6 3	38	40
3	8¾	44	444 5/12	36 10 0	16 4 3	20 5 9	37	40
4	10	44	389 5/12	32 9 11	16 4 11	16 5 0	34	40
5	9½	44	436	35 3 2	17 4 11	17 18 3	38	40

Summary.

A glance at Table 9 reveals that the cost of feeding Pens 2, 3, and 4 was very much the same, while the other two, Pens 1 and 5, show an increase in the cost of from about 16s. to 20s.

The pen on soaked wheat made an improvement when compared with the results of 1936–37, moving up from fifth to third place. This result, however, does not show any decided advantage in either the cost of production or the profit. The pen on soaked barley has proved the unsuitability of this method of feeding fowls, in view of the fact that it dropped from fourth place in last year's results to fifth place this year.

The dry mash has not done as well as last year, being fourth this time instead of first. It should be mentioned, however, that the birds in this pen were transferred to the dry-mash method of feeding about four weeks before they started to lay, whereas birds on the dry-mash method in the 1936–37 test were reared on dry mash from day-old.

It is interesting to note that the pen which showed the greatest profit (Pen 2) produced the eggs the cheapest, being only 8d. per dozen, whereas the pen on soaked barley, which showed the least profit, cost the most to produce—namely, 10d. per dozen.

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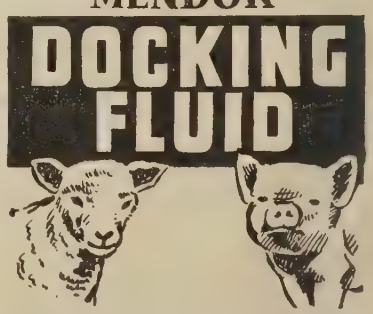

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Agricultural Regulations.

The Cool-stored Butter Regulations.

A. E. Morrison, Solicitor, Department of Agriculture.

THE purpose of these regulations, which came into force on the 11th November, is to compel the disclosure to the Primary Products Marketing Department of particulars of all butter held in cool store with a view to the prevention of speculation in the sale of butter for local consumption.

For the purposes of the regulations a cool store means any premises or place used for the cold storage of butter for sale by wholesale or by retail, the storage-capacity of which is not less than 40 cubic feet. Thus, normal supplies of butter held in cold storage by retailers for the purpose of their business are outside the scope of the regulations. In addition, supplies held in cold storage on behalf of a manufacturer of butter or the Department are not within the scope of the regulations.

Subject to these exceptions, occupiers of cool stores are required to furnish to the Department a return showing in respect of all butter held in cold storage at the commencement of the regulations :—

(*a*) The name and address of every person on whose behalf such butter is held.

(*b*) The total quantity held on behalf of each person.

(*c*) The respective dates on which the butter was deposited for cold storage.

(*d*) The total quantity deposited on each date, and

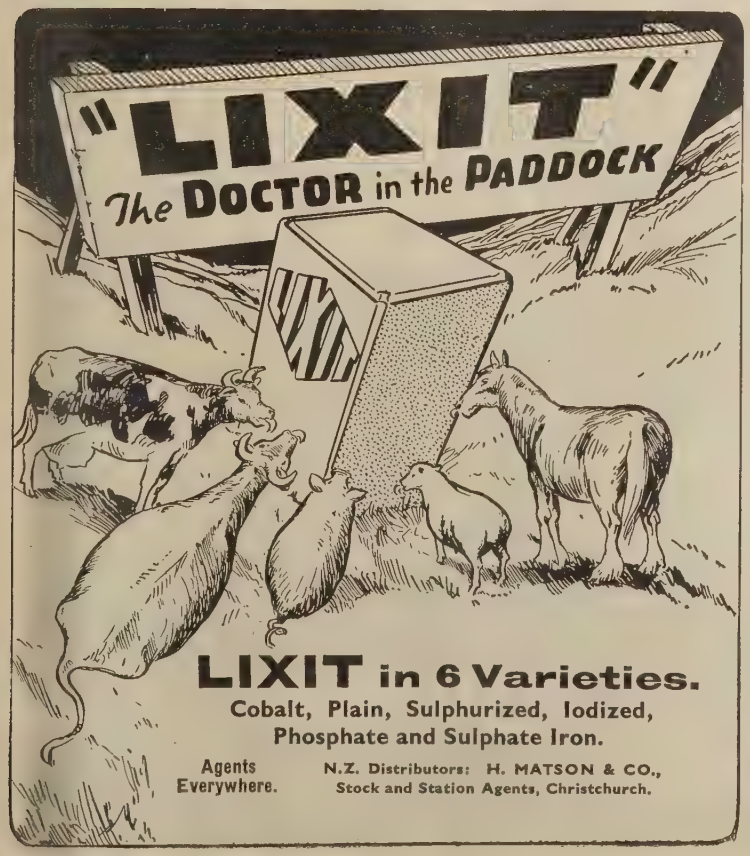
(*e*) The respective grades of the butter at the respective dates of deposit for cold storage.

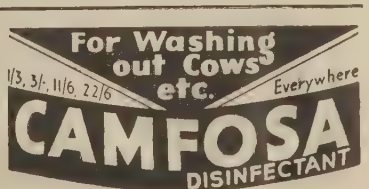
At any point of time specified by the Department after the commencement of the regulations occupiers of cool-stores may be required to furnish similar returns of cool-stored butter upon receipt of a notice from the Department requiring the delivery of such returns.

The Department is empowered to acquire or take any cool-stored butter by notice given to the owner thereof. The price to be paid by the Department for any such butter shall be the price that would have been payable by the owner if it had been purchased by him on the date on which it was deposited in cold storage. If at the date of acquisition or taking by the Department, however, the butter has deteriorated in grade the price payable by the Department shall be the price that would have been payable by the owner if it had been purchased by him at the lower grade on the date on which it was deposited in cold storage.

Copies of the regulations, which are administered by the Internal Marketing Division of the Primary Products Marketing Department, may be obtained from the Government Printer, Wellington, price 2d. per copy, plus postage 1d., remittance with order.

Before the crop is harvested estimates of yield are often made by digging up a few roots. A quick method used by one or two growers in the Rangiora district has been found to check up fairly closely with actual yield. Four roots are dug close together and the total weight in pounds equals yield in tons per acre. Three or four weighings in different parts of the paddock make sufficient allowance for ground variation.





Factors in Successful Farming.

(10) Farming Efficiency and Recording.

W. N. PATON, Senior Investigational Officer, Accounts Division.

MODERN farming is really a technical business; therefore scientific method needs to be adopted in management in order to be most efficient and successful. This requirement does not imply that each and every farmer needs to have had the benefit of a higher education entailing the various science subjects. In actual practice all that is necessary over and above a primary-school education (admitted that to have had a secondary-school education may be a distinct advantage) can be acquired readily by those who are prepared to look upon education as something of which we only receive a foundation while at school, and which really should continue unabated throughout our useful years of life.

Remaining a Student.

Such a course means remaining a student at all times and progressively becoming more apt and skilled in acquiring and using knowledge as a result of accumulated experience. All progress in knowledge is built on past knowledge, and all knowledge is the result of experience; experience is of little value unless we are able to learn something from it. Our aim should be to learn the most possible from experience, and this can only be done by being extra-observant and by closely studying what we observe. To enhance observation and study, recording has to be resorted to and method applied in doing all three things. By doing just that we are being scientific.

As one noted scientist put it, the five essential points to the scientist are (1) skill in observation and experiment, (2) memory and knowledge of relevant facts, (3) ability to reason and think in a logical, systematic way (4) cultivation of the imagination, and (5) development of a critical and impartial judgment. None of these requirements need deter the average farmer from striving to be reasonably scientific and therefore efficient in his endeavours.

Efficiency.

Highly efficient farming can only be attained as the result of scientific management, whether applied consciously or otherwise. Let us by all means apply it consciously. In a complicated business, such as farming, efficiency is one of those

things which can only be developed progressively. Hence, we have to work to a plan in the development of efficiency, and as an incentive set up some objective or goal towards which to strive.

Efficiency has continually to be subjected to measurement in order that the progress being made can be ascertained. For the purpose of measurement of efficiency in production suitable units have to be utilized. In the industrial field costs are usually measured in terms of unit quantity of the final product, whereas efficiency is best gauged by expressing what quantity of the final product is obtained from a given quantity of the raw material operated upon. In farming, the raw material utilized cannot be closely measured as in the case of manufacturing, and farming efficiency is usually gauged in terms of production per acre.

This represents the principal and most important unit of measurement, but in going more closely into our problems, units have to be employed which measure efficiency not only as between the first and last stages of the exploitation chain, but also as between any two stages, or at various points within a stage. Hence, in live-stock farming we utilize such units as head of productive stock carried per acre, and of production per head of stock, &c. We have to measure, also, the efficiency in the utilization of labour, of materials involved, and, in fact, of all things which can be counted, measured, or described according to given standards. Then, again, efficiency is measured in terms of unit costs not only at the final stage, but, where practicable, at prior points as well. A consideration of this aspect, however, will be reserved for treatment in the next article.

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Recording.

It has been emphasized already that by being methodical we are being scientific, and that scientific working and management enhances efficiency. By drawing up a carefully planned long-range programme of farm development at the outset and preparing a detailed outline each year of the work for the season ahead farmers are better enabled to make progress. Another valuable step is to adopt regular and systematic recording. Not only do such records provide the essential data from which efficiency can be measured, but they also furnish detail necessary in the interpretation of accounts and in solving farming problems of many kinds.

The details of a farmer's experience, when properly recorded, are invaluable to the agricultural expert when he is called in to assist. One farmer's records of difficulties may be insufficient in giving a lead to the cause of the trouble experienced, and hence records from other farmers (generally those in the immediate neighbourhood) are often necessary. This last-mentioned requirement of the investigating officer can only be met by a more general adoption of detailed recording.

The reason more of this work is not done appears to be due to the attitude, "Why compile a whole lot of records that may never be needed?" Such work properly done is never wasted effort. Subjected to close study it will always prove informative. Its self-educative value cannot be too greatly stressed. Through this course alone a farmer can ensure that he remains a student throughout life.

It is only by being acquainted with farming problems in this manner that corrective measures advocated by an agricultural service can be harnessed to best effect. Moreover, the advice of others is never so convincing, nor does a successful outcome provide so much satisfaction as when we discover things for ourselves. Therefore, the motto of farmers should be "self-help first."

✣ ✣ ✣

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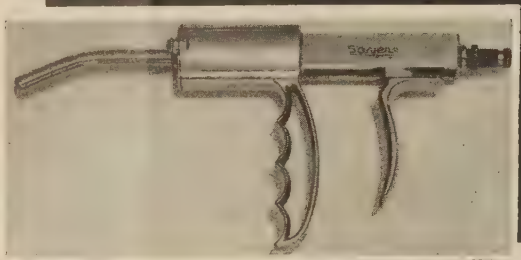

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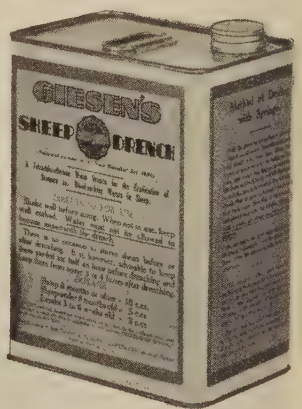

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Protecting Bee-combs from Wax-moth.

Precautionary Measures Described.

T. S. Winter, Apiary Instructor, Hamilton.

WORKERS in wax are not a numerous company so far as species are concerned; the true wax-workers are the honey-storing bees (*apis*). The discovery that if the socials (*apis*) retained honey in their stomachs their vital chemistry would convert it into wax brought this species into world-wide prominence.

The discovery of the secret wax-production and the acquisition of the knowledge of its ductibility and application to use of the community have made all the difference to the honey-bee and have brought one species (*apis mellifica*) completely under the subjection of man.

In New Zealand to-day millions of bee-combs, each measuring 8 in. by 17 in., are in use in our commercial apiaries, and these combs must be stored away for months at a time when not in use in the hives. Not until recent years have bee-keepers in New Zealand been greatly troubled by the ravages of wax-moth.

Infection.

This article is intended to show how bee-combs become infected, and how to deal with their preservation.

In the early days of New Zealand pollinating insects which fed upon nectar were plentiful, but the chopping-down of bush areas and the clean cultivation of our fields have added greatly to the difficulty of survival of many useful insects, with the result that more dependence has to be placed upon the honey-bee, the only pollinating insect that can be controlled. This widespread cultivation of single plants over large areas has, to a certain extent, upset the balance of Nature by encouraging an abnormal condition of insect population. Injurious species, which are afforded an enormous food-supply, prosper and multiply until they become a positive pest.

So it is with the honey industry. Tens of thousands of hives scattered throughout the country, each producing its quota of beeswax annually and making it into combs for the storage of pollen and honey, provide special feeding-grounds for wax-moths.

There are two kinds of wax-moth—the larger one (*Galleria mellonella*) and the lesser wax-moth (*Achroia grisella*).

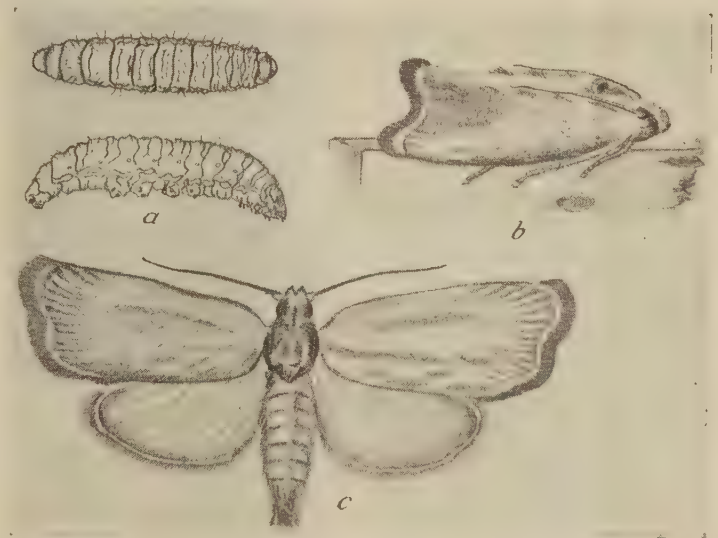

Fig. 1.—(a) The larvæ of the greater wax-moth; (b) the greater wax-moth resting in the natural position; (c) the adult female with wings extended.

They are of Oriental origin, and are now found in almost every country of the world.

Large and Small Moth.

The large moth was first introduced into America from Europe about 1805, although honey-bees were introduced long before that time. In New Zealand this moth was first reported in 1904 in the Taranaki district, and it has gradually spread over the whole of the North Island, thriving particularly well in the northern areas.

Figure 1 (*a*) shows the larvæ of the greater wax-moth, Fig. 1 (*b*) the greater wax-moth resting in the natural position, and Fig. 1 (*c*) the adult female with wings extended. The normal female adults are approximately $\frac{5}{8}$ in. in length, with a wing expanse of $\frac{1}{4}$ in., while the lesser wax-moth is about half that size.

Life History and Habits.

V. G. Milum and H. W. Geuther, Entomological Laboratories, University of Illinois, who recently made exhaustive investigations into the life history and habits of these moths, stated that the number of eggs laid by individual females of the greater wax-moth varied from 400 to 839 in a group of twelve females, the average being 754 per individual. Eggs were deposited singly to as many as 127 in one group. The proportion of sexes in a group to 323 adults was 172 males to 157 females. It was also observed that the female greater wax-moth preferred to lay her eggs in the tiniest cracks and crevices, which barely admitted her ovipositor. This is done, no doubt, for the protection of the eggs.

In warm weather the eggs may be hatched over a prolonged period, which means that the tiny larvæ may be constantly entering the hives through the cracks and unsealed crevices. Wax-moth larvæ are able to digest beeswax, yet they require a mixed diet. They definitely do not thrive and grow to normal size on combs free from pollen and on the remains of brood rearing, while comb foundation remains almost untouched by

them. When the greater wax-moth larvæ are allowed to feed upon a limited supply of brood combs each succeeding generation of adults become smaller and smaller, and errors of identification are often accounted for by this fact.

Lesser Wax-moth.

G. Kunike, who thoroughly investigated the life history and habits of the lesser wax-moth, is frequently quoted by Milum and Geuther. Among other things, Kunike reports that the male moths have an average life of twenty-three days and the females seven days, and also that within a few hours after mating the female starts laying her eggs. The average number of eggs per female is from 250 to 300, although as many as 460 have been deposited. He found that at 86° F. eggs hatched in five days, at 68° F. after ten days, and at 60° F. after twenty-two days, while above and below these temperatures the eggs do not hatch, but are killed.

The total time required for a generation is approximately two months, with variation due to temperatures and availability of food. Soon after hatching the larvæ start building individual tunnels of silk thread smeared with excretor and particles of comb in which they live, eating their way forward. When feeding ceases the tunnels are extended beyond the food-mass, and at the point of pupation a tight case is constructed. The lesser moth larvæ tends to have its own individual tunnel, while the greater wax-moth larvæ congregate.

The nature of the food eaten and the general surroundings enable the larvæ, when not disturbed, to withstand very cold temperatures. Kunike clearly established that the larvæ are the over-wintering stage of the moth—a period when so much damage is done to unprotected bee-combs.

Method of Control.

Now that the large bee-moth is thoroughly established in this country beekeepers are warned to take the necessary measures to protect their bee-combs from this pest, especially when the summer and autumn months are longer and warmer than usual, which provide ideal breeding conditions. Colonies of bees in normal condition and housed in a proper manner can deal quite effectively with the intruders. Even black bees, when kept strong, will keep their premises free of the pest. They should be helped, however, by keeping the floor boards clean and free from refuse. If a colony becomes hopelessly queenless and is left unattended for any length of time it will fall a prey to wax-moth.

The careful beekeeper has nothing to fear in the apiary if all colonies are kept in normal condition, but unprotected stored combs provide natural feeding-grounds for these moths. The surest method of control is to keep the flying moths away from the supers and combs, and to do this it is necessary to provide a large moth-proof room which can be conveniently fumigated. Such rooms are

not available to the majority of large commercial beekeepers in New Zealand, and therefore the supers and combs are usually stacked in open sheds or some building with plenty of ventilation.

Stacking the Supers.

The supers may be stacked six or seven high in rows on floor boards with the entrance closed, or in a similar way to allow a dessertspoonful of calcium cyanide to be placed in a shallow tin or just scattered inside and underneath the bottom bars of the frames in the bottom super. If floor boards are not available, or they take up too much room, anything that will fit tightly and allow access to the bottom super will do.

Calcium cyanide is effective against the larvæ pupa and the adults of the wax-moth, but it cannot be relied upon to kill the eggs. It is therefore necessary to fumigate at intervals of not more than three weeks. Calcium cyanide is sold by wholesale manufacturers in powder form. It is non-inflammable and non-explosive, but care must be taken not to breathe the gas formed when the powder is exposed to the moisture-laden air. A hive lid or something similar should be firmly placed on top of each stack of supers.

Carbon bisulphide may be used, but it is highly inflammable and poisonous. A sponge or cloth is saturated with the liquid and placed on top of each stack of combs underneath the lids. When exposed, the liquid changes to an evil-smelling gas, which is heavier than air and gradually filters down through the stack of combs. Fumigation should be repeated at intervals the same as with calcium cyanide.

Three Classes.

Because of the feeding habits of the wax-moths domestic beekeepers and small commercial beekeepers should sort the bee-combs into three classes :—

(1) Clean, new combs, no brood-rearing and no pollen.
(2) Empty combs, no pollen and little brood-rearing.
(3) All dark combs containing pollen and the remains of brood-rearing.

All combs classed under heading (3) should be safely stored to allow frequent treatment by fumigation. All combs should be spaced as wide apart as possible in the supers and not more than eight or nine to the super. If super accommodation is available it is best to place only eight in each.

One large beekeeper in this district stores his combs in an open shed and places a double sheet of newspaper between each two or three supers, with a quarter of a cake of camphor in each. He reports that the bees do not object to the combs stored over winter in this manner.

Still another preparation, Para-dichlorbenzol, which is packed in crystal form, is an excellent fumigant. A little more work is necessary, however, as the cracks between the supers must be gummed tight with paper. The gas generated is pleasant to smell, and is non-injurious. The white crystals should be placed in the top super on top of the frames, and, when dissolved, more crystals should be added.

It should be remembered at all times by beekeepers that the moths fly at night, that the females lay their eggs at night, and that the eggs are laid in crevices about the hive and supers where the newly hatched larvæ will find easy access to the combs. These moths are not attracted at night by artificial light, and they shun the daylight and rest during the daytime.

Four years ago a Hamilton orchardist put approximately six buds of Purple King plums per tree into several Burbank trees. These buds grew well, and there are now six vigorous Purple King arms overshadowing the Burbank. These arms are bearing this season. The effect of the vigorous growth of the Purple King has been to influence the Burbank in the same direction, and the past two years the Burbank limbs have commenced renewed growth and vigour, and the fruit has been favourably influenced and is much larger in size than normally.

✣ ✣ ✣

Bledisloe Medal Award.

Won by Mr. P. W. Smallfield, Fields Superintendent, Auckland.

AWARDED to the old student of Canterbury Agricultural College who has, as a result of his training at the college, materially assisted agriculture in New Zealand or has otherwise forwarded the country's interests, the Bledisloe Medal has been won this year by Mr. P. W. Smallfield, M.Agr.Sc., Fields Superintendent for the Auckland District, Department of Agriculture.

This medal, accompanied by an endowment fund, was presented to the Board of Governors of Canterbury Agricultural College in 1929 by His Excellency Lord Bledisloe, Governor-General of New Zealand. The medal is awarded annually to the old student of the college after consideration of the nominations of the Old Students' Association by the Board of Governors.

The list of Bledisloe Medalists to date is as follows :—

1930 : The late H. A. Knight, Racecourse Hill, Canterbury.
1931 : J. N. Ranstead, Matangi, Waikato.
1932 : Geo. Rennie, Taupiri, Waikato.
1934 : W. O. Rennie, Doyleston, Canterbury.
1935 : G. H. Holford, B.Ag., Department of Agriculture, Wellington.
1936 : A. W. Hudson, B.Agr., B.Sc., Massey Agricultural College.
1937 : R. J. Low, Methven, Canterbury.

Personal History.

Mr. Smallfield was born at Auckland on 19th February, 1898. He received his secondary education at St. John's Collegiate School and at the Auckland Grammar School. At the Grammar School he played in the First Fifteen, was a school prefect, and the champion rifle shot.

During 1915–16 he attended Auckland University College, commencing the course for the B.Agr.Sc. degree. He also attended engineering lectures at the School of Mines. During 1917–18 he was in residence at Canterbury Agricultural College, Lincoln. In May, 1918, he went into camp at Trentham, and was attached to the New Zealand Engineers.

Mr. P. W. Smallfield.

During his stay in England at the conclusion of the war he was attached to the New Zealand Expeditionary Force Education Staff with the rank of warrant officer. In England he studied farm practices in the districts in which he was stationed, and visited experimental farms and places of agricultural interest.

He returned to New Zealand in October, 1919, and then to Canterbury Agricultural College, where he remained in residence until December, 1920. He completed the course for the degree of B.Agr.Sc. and gained first place in practical and theoretical work at the college diploma examinations, for which he was awarded the college gold medal. At the college he played in the First Fifteen and was swimming champion.

In February, 1921, he joined the staff of the New Zealand Department of Agriculture as an Assistant Instructor, and in August, 1923, he was transferred to the Ruakura Farm of Instruction as lecturer and officer in charge of the instructional work. In 1928 he was promoted to Fields Superintendent of Auckland Province, and was among the first to qualify for the newly instituted degree of Master of Agricultural Science.

His Work in the Department.

As Instructor in Agriculture at Auckland Mr. Smallfield carried out important investigational work in connection with lime sources and supplies in North Auckland and fertilizer use and responses in South Auckland, as well as instructional work to farmers throughout the province.

He organized and supervised at the Ruakura State Farm an excellent agricultural course for farmers' sons, which has been taken advantage of by from fifteen to twenty-five boys a year for the past fifteen years. Promoted to Fields Superintendent for Auckland some nine years ago, he has had full charge of the Fields Division extension work and experimental work among farmers throughout Auckland. His wide knowledge of farms and farming, his ability to give a sound opinion and advice has been an inspiration to his staff.

The main claim from the point of view of value to the farming community of New Zealand is his work in demonstrating, by the development of some thousands of acres of pumice land of the central plateau of the North Island, the possibilities of this country as farming-land. His work in the development of the Ngakura blocks to permanent grass capable of butterfat production per acre of more than 200 lb. opened the way for the extensive development of Crown and Native lands. The development of the Ngakura blocks was based on an accurate estimate of per-acre cost given by Mr. Smallfield, and it was due to his energy, initiative, and thoroughness that the work was so well done.

With the development of Ruakura State Farm as an experimental and research base in animal husbandry, he has taken a leading part and is likely to find his *métier*. Experimental work and investigation in pig-management on dairy-farms, dairy-stock management and feeding, pasture management and utilization, and, more recently, investigational work regarding feed-flavour in milk, dietetic troubles in dairy stock, &c., and facial eczema investigations are in progress, and the design of the investigations is largely in the hands of Mr. Smallfield.

To all this work of animal-husbandry investigation he is bringing his initiative, ability, perseverance, and, above all, thoroughness, and it is in this sphere that he is demonstrating his value and service to the farming community more, perhaps, than in any other he has yet undertaken.

❖ ❖ ❖

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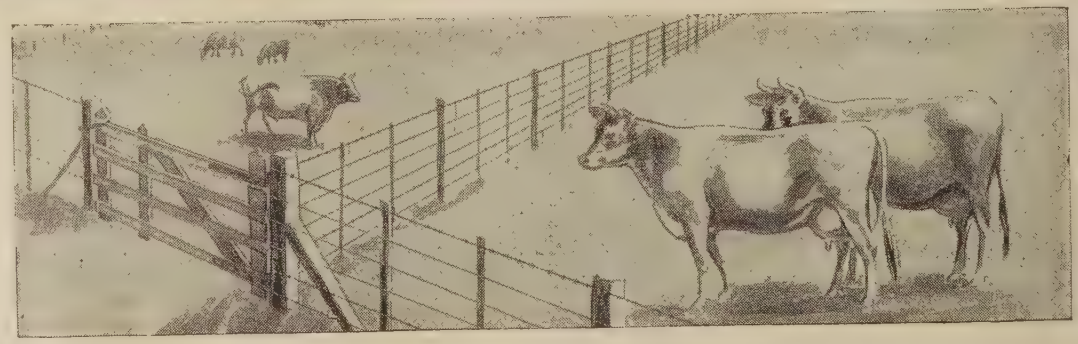

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Farm Practice and Management.

Contributed by Officers of the Fields Division.

Previous Grazing-management Affects the Silage and Hay Crops.

IN the Ruakura grazing trials silage and hay crops have been taken after hard winter-grazing and after lenient winter-grazing—that is, winter-spelling. In each of the two years of the trial there has been an astonishing difference in the crops grown for silage and hay after these opposite kinds of grazing-management.

The following scheme shows the main differences :—

Silage after Winter-spelling.

Ready in about seven weeks.
Very even crop.
Heavy crop.
Mainly rye-grass and fog with no sweet vernal.
Excellent aftermath and clover-growth maintained through dry summer.

Silage after Winter-grazing.

Takes about four weeks longer.
Very patchy crop.
Very light crop.
Mainly rye-grass with some sweet vernal, but no fog.
Aftermath quite good, but clover-growth not maintained through dry summer.

Hay after Winter-spelling.

Gives much fog and cocksfoot, as well as rye-grass.
An even crop.
No weeds.
Ready sooner, cut sooner, aftermath sooner, and therefore can be grazed sooner.

Hay after Winter-grazing.

Rye-grass dominant, but little or no fog and cocksfoot.
Very patchy indeed.

Fig. 1.—Silage after winter spelling. Note the heavy and even crop.

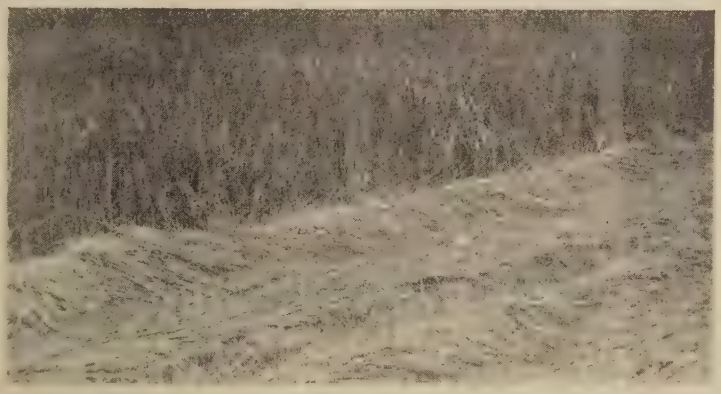

Fig. 2.—Winter-spelled pasture cut for hay on 26th October, 1938.

Very much plantain and other flatweeds. Takes longer and, because it is cut later, is likely to give a poor aftermath.

The nutritive values of these two kinds of silage and hay is not yet known. This is unfortunate, for it is possible that there may be a big difference which could outweigh the advantages of taking silage and hay crops after winter-spelling.

In the meantime it may be as well, until more is known about the feeding-value of different kinds of silage and hay to base our management on the knowledge we have, and this leads us to the conclusion that silage and hay crops should follow winter-spelling rather than winter-grazing.

—E. R. Marryatt, Fields Instructor, Ruakura Farm.

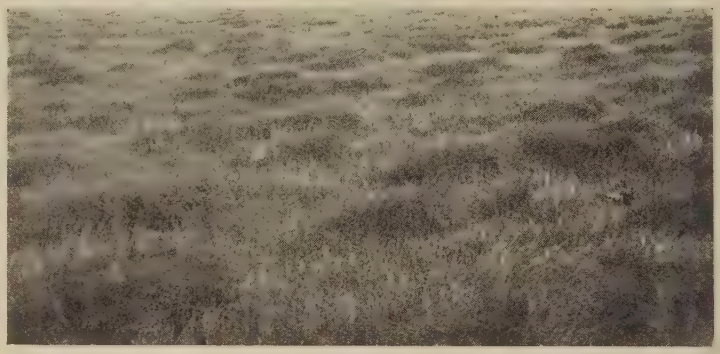

Fig. 3.—Silage after winter grazing. Note the patchy crop.

Spread of Heath in Nelson District.

THERE is little doubt that the early colonists introduced to their gardens the plant *Erica arborea*, commonly called heath. To-day it may still be observed "within the garden walls." In the memory of the early settlers heath was planted as an ornamental shrub. From this stage they have watched it spread over wide areas of the Moutere clays.

While it appeared no menace on the gorse-covered foothills, its further invasion on grazable hill pasture, together with its acknowledged difficulty of control, now places it in the class of one of the district's despised introductions.

The Moutere clays fringe the coast of Tasman Bay for twelve miles, extending inland to cover an area of approximately 400,000 acres. In the main, they are of low fertility; they lack lime, phosphate, nitrogen, and organic matter, and the trace elements boron and cobalt. On the sunny, coastal slopes are Nelson's apple-orchards. Farther inland there is extensive afforestation, and wide stretches of hill pasture, with some unproductive wastes carrying little vegetation other than scrub and fern.

Strange as it may seem, the spread of heath has been noted only on the Moutere clays. On this soil-type the shrub has widespread distribution in the Mapua, Orinoco, Dovedale, Neudorf, and Wakefield districts. The country, admittedly, is poor, but no measures of the settlers have been successful in combating the spread of heath on their hill lands.

Cutting and burning the plants seems ineffective; the heath appears to grow with renewed vigour. Because of the tough, woody nature of the heath plant pulling it is impracticable, while on certain areas there is such a smother of plants that no pasture growth is possible. When grown under the care and protection of garden lovers heath forms a robust shrub and attains a height of 10 ft. or more. In the field it commences flowering as a small plant, and the apparent mature stage is reached in a thick scrub of 5 ft. to 6 ft. Like gorse, the flowering-period is of extended duration.

Although in-flower specimens may be gathered from June to November, the full flowering peak appears to be reached in the month of August. The white, bell-like flowers, of which there are thousands per plant, mature myriads of small, smooth, dust-like seed, which is readily wind-borne or carried in the fleece of sheep. Seed dispersal is effected in February. Young plants establish apparently with little difficulty, chiefly due to the poor, open swards on much

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of this hill-class pasture. Heath appears to be unaffected by either insect pest or stock.

While the general spread of gorse on much poor clay country of this type is looked upon by graziers not with complete disfavour, heath most certainly is a useless and unwelcome shrub. Were it economic either to cultivate, lime, or top-dress the areas where it flourishes, some control might be effected. Fire and cutting fail, and therein lies our difficulty in the eradication from poor though productive pastures of another introduced plant, "gone native."

—D. M. E. Merry, Instructor in Agriculture, Nelson.

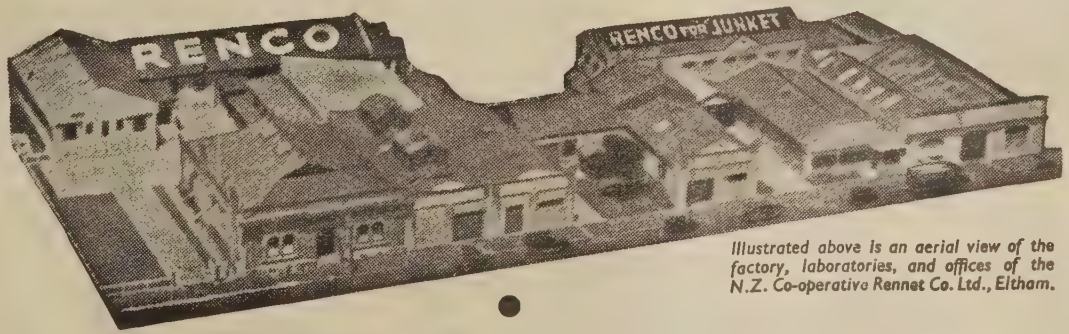
Electric Fences for Pig-runs.

Fig. 1.—A temporary pig-enclosure on a rough area. Two wires are sufficient to confine the pigs.

PIGS are probably the most difficult farm animals to control, and they sometimes cause a great deal of trouble between neighbours. Fences must be pig-proof if this is to be avoided and the best results obtained from them. The cost of materials often prevents the expansion of this industry where it could and should be extended.

The usual method is to enclose areas with pig-proof fences of a permanent nature. These areas often become a sea of mud after a few weeks of wet weather, and to be able to change the runs, if only until the piggeries are dry, is invaluable in every way. Many farms have odd acres, referred to as "dirty corners,"

THE LARGEST RENNET FACTORY IN THE WORLD.



Illustrated above is an aerial view of the factory, laboratories, and offices of the N.Z. Co-operative Rennet Co. Ltd., Eltham.

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ELTHAM.

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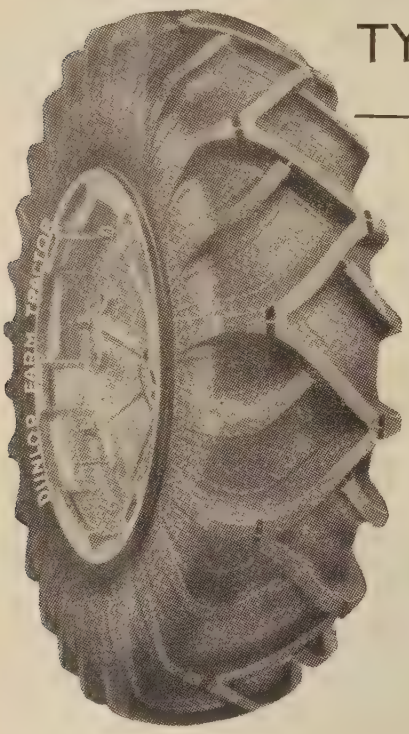

Dunlop offers a full range of tyres for every farm vehicle—from the largest tractor to small trolleys, hand carts or wheelbarrows. And when you buy Dunlop tyres you not only "Buy British" but you also add your contribution to New Zealand's policy of reciprocal trading.

You have a choice of two types of tractor tyres

. . . and they sell at the same reasonable price. Each provides amazing pulling power in the toughest going. Each is built up to the standard for which Dunlop tractor tyres are famous. Farmers everywhere are converting iron rimmed tractors in favour of Dunlop tractor wheels and tyres. See your nearest Dunlop dealer and ask for a quotation.

Carts, wagons, and animal-drawn vehicles of all kinds are rapidly changing to Dunlop pneumatic equipment. These tyres allow easy transit over heavy ground; loads are carried silently and smoothly. Speed is increased and heavier loads may be carried without damage to roads or pastures. With these tyres *air instead of iron supports the load.*

Eventually, all wheelbarrows in use on farms or smaller properties will be pneumatically equipped. It costs very little to equip with Dunlop . . . the advantages are obvious.

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DL. 25.

where pigs could run and do good work in cleaning them up, and there are thousands of acres of fern land where pig-raising could be carried on profitably if the animals could be controlled economically.

The writer has been observing seven pigs on an area of approximately ⅛ acre. They have been confined there for eighteen days, and have not made any attempt to get out even when a dog got among them. The only barrier is two barbed wires charged with electric current from a battery. The illustrations show the area and the type of material used, and also where the pigs have rooted. This is clearly defined, and rootings are not on the outside of the wires.

The posts consist of any odd pieces of timber found on the farm, and the wire is very second-hand. On this area a few old blackberry bushes were growing, but they are now disappearing. When the time arrives a fresh area will be fenced. The area shown is approximately 6 chains from the milking-shed, where the battery is housed, and in that length the wires run on two sides of an orchard, which, incidentally, sheep grazing on the adjoining pasture make no attempt to enter.

Fig. 2.—A view taken from the pig-enclosure. Note that there is no rooting beyond the wire.

With improved and economical means to aid them, farmers and pig-raisers have an opportunity of increasing the numbers of pigs—a valuable industry yet in its infancy and capable of vast expansion.

—H. A. Bayley, Inspector of Stock, Whangarei.

GOOD FARMS ARE BUILT WITH SAVINGS

WALLACE Haymaking Equipment

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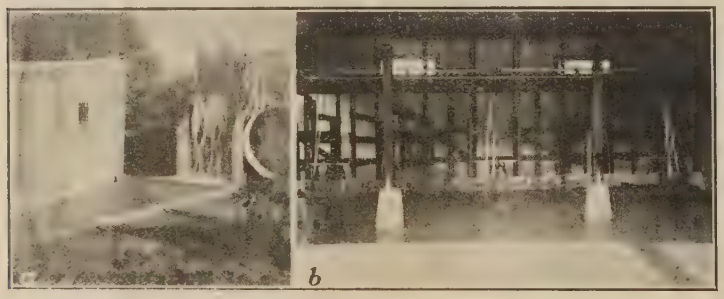
The Oliver Hayrake is designed specially for speed, strength and long service. Its bridge-trussed frame prevents sagging or twisting and guarantees long life and perfect running. All levers and pedals are most conveniently placed for speedy operation and the dump mechanism works at the lightest touch on the dump pedal. The Oliver handles light or heavy crops under any conditions and with both speed and efficiency. The coupon will bring fully illustrated literature.

OLIVER RAKES SAVE TIME & MONEY

Power and Cleanliness from the Same Source.

BY the ingenious use of a convenient spring, Mr. L. Andrews, of Kaitoke, obtains an almost costless source of power for his milking-shed and at the same time maintains absolute cleanliness of the floor of shed and yards.

A 4 in. pipe running about two-thirds full provides sufficient water to operate a wheel (Fig. 1) which, with the aid of a suitable gearing system, drives the milking plant. As it falls from the wheel the water is led through the walls on to the floor of the shed (Fig. 2).



(a) Showing how the water-power is obtained. (b) The water circulating on the floor of the milking-shed.

Careful levelling of the concrete has resulted in an even flow of probably ½ in. in depth over the whole of the shed and holding-yard. As can readily be understood, this arrangement achieves the hygienic ideal of cleanliness and freedom from odours.

—N. Lamont, Instructor in Agriculture, Masterton.

Yields of Sugar-beet.

FURTHER trials are being conducted by the Fields Division in the South Island and in Hawke's Bay to investigate the yields of sugar beet and approximate costs of production under New Zealand conditions.

Club-root in Turnips.

SIX experiments on the manuring of turnips have been laid down in the South Island. Variety trials have been established to obtain some information on palatability, together with the physical and chemical properties of different varieties. Various strains of club-root-resistant varieties are being tried out on land likely to be infected with the disease. The investigation into the effect of borax on brown-heart of swedes is being continued, and efforts are being made to find a suitable method of applying borax with fertilizer and seed without causing germination injury.

The appearance on the market of two proprietary remedies for club-root have necessitated trials being carried out with these materials. Where club-root has been present neither of them have succeeded in controlling the disease, and as several tons of the so-called remedies have been sold to farmers in Otago and Southland it is probable that much disappointment will be experienced from the results secured. Farmers should be warned against using any specific for disease-control which has not been tried out experimentally.

—Annual Report of Director of Fields Division.

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Whether it be light, medium, or deep cultivation, the BEVIN HARROW *can* be easily adjusted to suit.

No. 1 Tine is penetrating ¼ in.
No. 2 Tine is penetrating ½ in.
No. 3 Tine is penetrating 1¼ in.

All the Tines can be set to penetrate even lighter than No. 1 or deeper than No. 3.

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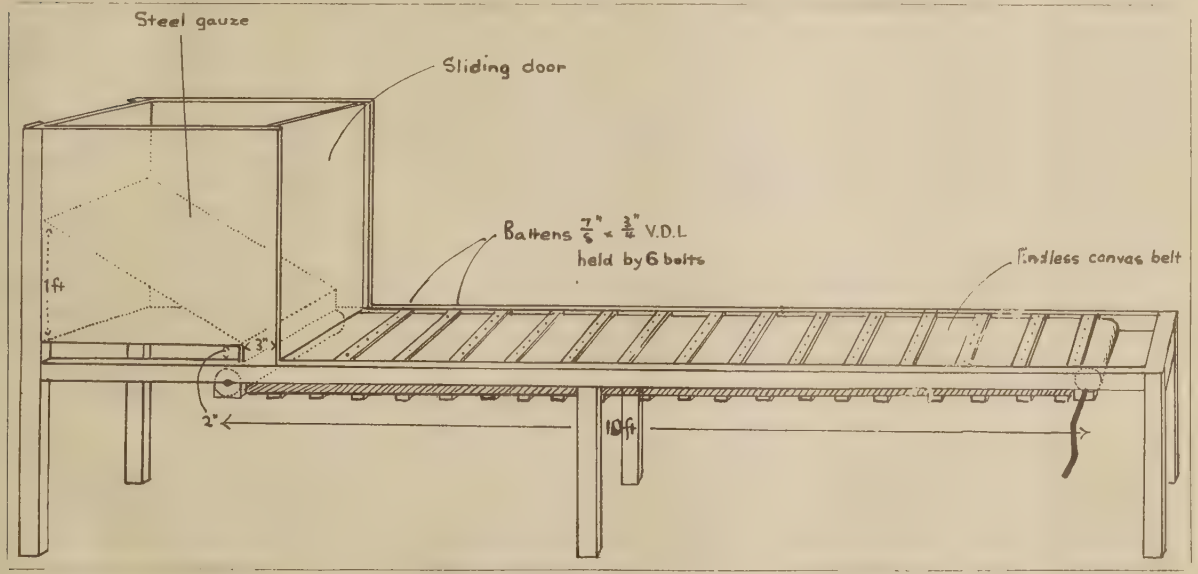
Hand-sorting Potatoes.

WHEN hand-sorting potatoes, especially the seed, some growers use a grading-table to simplify the work.

A simple type in use is one fitted with a hopper or wooden box at one end and built to a size suitable for holding a quantity of the potatoes to be sorted. From there the potatoes pass out on to an apron, made on the principal of a narrow binder canvas. This apron travels on wooden rollers, and is moved forward as required by turning a handle fitted to one end of the outer roller, the potatoes being picked off by hand and placed in sacks hooked along one side of the table frame.

A rather more elaborate machine than the one mentioned above is in use in the Annat district. This is electrically driven. The grading-table is brought forward by power, which can be conveniently shut off by the operator when the supply of potatoes coming forward is in excess of what the pickers can handle satisfactorily.

—J. G. McKay, Fields Instructor, Christchurch.



A sketch plan of the hand-operated potato-sorter.

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MILKING TIME.

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Shorten the hours in the bail—increase the milk yield—
Use
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Thousands of Dairyfarmers throughout the Dominion are praising MILKEEZE—the ideal preparation for sore, wounded teats, and cracked, swollen udders.
MILKEEZE keeps teats soft and supple. Positively does not taint the milk. *From all Chemists and Stores in*
1-lb. tins, 2/3; 4-lb. billies, 6/6; 36-lb. tins, 1/4 per lb.

Facial Eczema in Sheep and Cattle.

Prevention by Farm Management.

Contributed by the Facial Eczema Management Committee.

ALTHOUGH the weather will determine whether or not facial eczema occurs in the autumn of 1939, the Facial Eczema Management Committee considers that sheep-farmers in particular should now take definite steps to safeguard their flocks against the possibility of an outbreak. The committee summarizes a general plan of prevention as follows :—

(1) As facial eczema is apparently caused by a quick flush of grass in warm and humid weather following a period of drought, stock should be kept off rapidly-growing grass in the autumn for several weeks.

(2) In order to ensure that this practice can be followed, farmers should build up reserves of hay and silage and maintain a portion of their farm in mature grass, which can be grazed when a flush growth is taking place on hard grazed paddocks.

Seasonal Advice.

Mature feed should be provided to maintain sheep if a dangerous autumn flush of grass occurs ; to provide this mature feed action must be taken now. The Committee advises that sheep-farmers should close up from a quarter to a third of their farms in December. The areas closed should consist of at least four fields, so that the fields may be closed and utilized in rotation.

The first field should be closed early in December and the remainder at ten-day intervals during the month. For preference the December-closed fields should contain a fair proportion of cocksfoot and should be situated on land least likely to flush rapidly in the autumn—*i.e.*, moist flat or peat land or, if rolling country is shut up, choose land that lies away from the sun. The shutting-up of fields in which paspalum is dominant should be postponed until the middle of January.

Utilization of Mature Grass.

The suggested closing of several fields at intervals during December has been made to facilitate utilization. If good growing weather is experienced after December, the earlier closed fields may become too rank and may require grazing with cattle and then shutting up again, or, if these fields are not again closed, others should be selected to take their place.

If conditions suitable for the development of eczema occur, the fields must be grazed in the autumn so that only mature feed is eaten ; experience this year showed that after eating down the mature feed the fresh growth may be dangerous to sheep. Sheep must therefore graze the fields of mature feed in rotation, being moved to the next one before fresh growth appears.

Holding-paddocks.

It may occur that fields of mature grass have to be carefully rationed to last the flock until the flush autumn feed is mature. The sheep may have to be fed partially on mature grass and partially on hay and silage. To facilitate rationing a special holding-paddock may be necessary where the sheep can be held for hay feeding.

This field could with advantage be one consisting mainly of paspalum or one situated on moist flat land or peat where no dangerous flush of grass is likely to occur. Ample shade is very desirable in this holding-paddock. In choosing paddocks for shutting up this factor must be kept in mind so that they are convenient to the holding-paddock.

Supplementary Feed.

The development of the practice of holding mature feed during drought periods will necessitate the provision of hay and silage on sheep-farms ; supplementary feed will have to be provided so that mature feed can be saved. On most farms the supplementary feeding of cattle in drought periods would allow of the spelling of sufficient grassland for the use of sheep when a dangerous flush of grass occurs.

The need for the provision of supplementary feed is stressed by the Facial Eczema Management Committee in their bulletin on the prevention of the disease by farm-management methods, and this aspect of control by management was brought under the notice of farmers early in the season.

Summary.

The Facial Eczema Management Committee's seasonal advice to sheep-farmers may be briefly summarized as follows :—

(1) Close up from a quarter to a third of the farm in December.

(2) The area shut up should consist of at least four fields to facilitate utilization.

(3) The first field should be closed in early December and the remainder at ten-day intervals during the month.

(4) The areas chosen for shutting up should consist of pastures least likely to quickly flush in the autumn—*i.e.*, pastures containing a good proportion of cocksfoot and situated on moist land or land lying away from the sun.

(5) The shutting-up of paspalum fields should be delayed until the middle of January.

(6) If good growing weather is experienced and a mature field gets too rank, it should be grazed off with cattle and the field closed again or another field closed to take its place.

(7) Holding-paddocks should be selected for supplementary feeding of sheep when a dangerous flush of grass occurs and the mature grass is being rationed out. These fields should consist of pasture land not likely to rapidly flush : paspalum pastures or pastures on moist land or peat. The fields should contain ample shade.

Following the recent outbreak of facial eczema in sheep and cattle, the Department of Agriculture issued a bulletin on farm-management methods designed to prevent the disease. The advice contained in the bulletin was prepared by the Facial Eczema Management Committee which has been set up to direct the investigations into the disease in the Waikato.

Farmers who have not read the bulletin are recommended to obtain a copy from the Department of Agriculture.

Horticultural Instruction.

Contributed by Officers of the Horticulture Division.

Orchard Notes.

Harvesting the Fruit Crop.

THE harvesting season for the main fruit crop is rapidly approaching, and much of the month's work should be in preparation for the handling of the crop. Spraying on most varieties of apples and pears should continue throughout January and February, and on later varieties into March.

There should be little cessation of spraying through January, which may be regarded as quite a critical month, especially in regard to insect pests. Cultivation may slacken off after the end of January, the final operation being in preparation of a good seed-bed for the sowing of a cover crop.

Handling the Crop.

The bulk of the fruit handled during the coming month will be stone-fruits. Considerable care is required in handling these fruits, as bruising, with rapid deterioration, will take place if the fruit is roughly treated. Fruit which has to travel any distance must be picked when firm.

With peaches, a greater volume of a specialized trade in tree-ripened fruit could be built up by growers, thereby stimulating the demand for dessert peaches. Even greater care in picking is required, however, with a minimum of subsequent handlings and the use of special packages, either trays or crates.

Improvement in Grading.

Much improvement in the general grading, packing, and get-up of stone-fruit may be made generally. Fruit should be sized and packed in a regular way, and only in the case of small sizes should fruit be jumble-packed. Larger sizes in peaches should be wrapped. Only clean cases should be used, and they should be neatly branded. Coloured paper liners add to the attractiveness of the package and protect the fruit as well.

The picking and packing of pip fruits, both for export and local market, will soon be under way, and every effort should be made to ensure that complete arrangements are made for the main harvest. Fruit-cases should be made up in advance, stacked conveniently, and kept under cover. A certain quantity may be labelled in readiness for the season. Strawboards and wrapping-paper require to be stacked conveniently for packers, and rubber stamps, stickers, and other requirements should be checked over to see that nothing is missing or out of order so that there will be nothing to cause delay.

Orderliness in Packing-shed

Orderliness in the packing-shed is essential for thorough and economic working. Fruit traffic through the shed should be in one end and out the other, and the packing-shed should be thoroughly cleaned out and kept clean. On no account allow reject fruit to lie about the packing-shed to rot, as unhygienic conditions in packing-sheds will cause excessive fungal rots to develop subsequently in stored fruits. Fruit-grading machines should be cleaned at frequent intervals, especially those parts against which the fruit moves, to save skin-injury to the fruit.

Particular attention should be given to maturity for picking. Fruit for immediate sale on the local market should be allowed to reach a greater degree of maturity than fruit intended for cool storage or export. Buyers are becoming more discriminating, and the demand is more and more for tree-ripened apples. Many of our dessert varieties of apples could be further popularized if attention were given to proper maturity for picking and marketing.

UNFAIR PACKING OF FRUIT AND VEGETABLES.

Recent prosecutions under the Orchard and Garden Diseases Act, 1928, for breaches of the regulations relating to the "fair packing of fruit and vegetables" indicates the desirability for directing the attention of growers of fruit and market-garden produce to what is required of those who pack fruit and vegetables for sale. The following clauses are contained in the regulations :—

Clause 1 : "Fruit" means the unmanufactured edible product of any orchard or garden plant, and includes potatoes, onions, tomatoes, and all other vegetables.

Clause 2 : All fruit sold, or offered or exposed for sale, in a container, whether wholesale or retail, shall be packed in such a manner that any fruit exposed to view, or that would be exposed to view if the container were opened in the normal manner, fairly represents in size, maturity, and condition the whole contents of the container.

WARNING—Clause 5 : Every person commits an offence against these regulations who directly or indirectly by himself, his servant, or agent fails faithfully to observe and perform any duty or obligation imposed on him, and is liable to a fine not exceeding £20.

The consequences of packing in a manner that deceives the buyer as to the size, maturity, and condition of the produce in the container does not react alone on the person who packs unfairly, but also affects other suppliers of the market, as well as causing a monetary loss to the purchaser.

Unfair packing is looked upon as a serious contravention of the regulations, and all packers are urged to give this matter their serious attention.

Thinning the Crop.

Any available time will be profitably spent in further fruit-thinning. The main thinning of apples and pears should be completed by the end of December. A second thinning is often required and is desirable, and may be undertaken in January. By this time there should be a good indication as to whether the thinning has been adequate to meet the seasonal conditions, and to what extent the fruits should be further reduced in number.

In any case, it is advisable to go over the trees a second time to remove fruit which is obviously undersized, misshapened, diseased, or badly russeted, and at the same time to break up clusters which may have been missed in the main thinning. By taking this extra trouble much time is saved in the picking and grading, when it is so essential that the shed staff is not hindered in a busy period through having to handle excessive quantities of rejects.

The time taken in extra thinning is fully compensated for in the subsequent work of handling the crop. The whole aim in thinning is to secure uniformity in size and to eliminate imperfect fruits.

Pests and Diseases Control.

Spraying of apples and pears should follow the lines indicated in previous notes. The general recommendation is for the continued use of lime-sulphur and colloidal sulphur, but a reduction of the strength of lime-sulphur as the season progresses. The maximum strength of lime-sulphur for the remainder of the season is 1–200 used with colloidal sulphur, 2 lb. to 100 gallons.

On Cox's Orange and Dunns it is advisable to use, as a fungicide, colloidal sulphur only. This recommendation will also apply to trees which are feeling the stress of a heavy crop or which may be in rather a stagnant condition through any cause. Heavily-laden Sturmers making but little growth do better when lime-sulphur is used more sparingly in late summer. Arsenate of lead should be added to all sprays, using not less than 1½ lb. to 100 gallons of spray. Two pounds of hydrated lime to every pound of arsenate of lead should be added to the arsenate before combining it with the sulphur spray.

With late applications the possible picking-date should be considered so that sprays may be so timed as to avoid having an excessive spray deposit still showing on the fruit. Red mite may increase rapidly any time during January, February, and March, and may appear in sufficient numbers to cause foliage injury unless checked. Under dry conditions this invariably happens. Growers generally should be on the alert, and should keep the pest under close observation.

Effective Controlling Agent.

The most effective summer controlling agent is summer oil applied at a concentration of 1 per cent. Such an oil will destroy both adult mite and summer eggs. To be effective a thorough application is absolutely essential. In the case of a heavy attack two applications ten days apart are advisable. Summer oil must not be used within ten days of a sulphur spray, and an interval of a week is advisable before resuming the ordinary sulphur applications following the use of summer oil.

In northern districts trouble is experienced with bitter-rot (*Glomerella*). Bordeaux mixture seems to have given the most satisfactory control to date. If humid weather conditions continue it is necessary to replace sulphur sprays with a weak Bordeaux strength 1½–3–50. At this time of the year there is no particular danger of causing russeting of apples through the use of Bordeaux if used at the strength recommended. The Bordeaux mixture may be combined with summer oil if the latter spray is necessary for the control of red mite.

The regular spraying of peaches with lime-sulphur 1–200 plus colloidal sulphur 2 lb. to 100 gallons for the prevention of brown rot and leaf-rust should be continued up to within a fortnight of picking.

Cultivation and Cover-crops.

If the season is proving dry, light cultivation should be continued throughout January or even later for the purpose of conserving all available moisture. Consideration should be given to the sowing of a cover-crop on land which is deficient in humus. Blue lupin is still the most favoured crop for the purpose, but it requires to be sown in January to secure sufficient growth by early winter. At the time of sowing an application of superphosphate, 1½ cwt. to the acre, is recommended to assist the lupin crop. If good tilth is maintained up to the time when sowing is recommended no additional preparation need be made. The seed is better drilled in, but a drill is not always available, in which case it is necessary to sow broadcast and to cover by the use of tine harrows.

—N. J. Adamson, District Supervisor, Nelson.

Citrus Notes.

Purchasing a Citrus Orchard.

WITH the approach of summer and the Christmas season intending purchasers of citrus areas are possibly making preliminary investigations.

What are the essential facts that a purchaser should take into consideration.

Firstly, there is in each citrus area a horticultural officer whose services and advice are available to any one intending to embark on citrus culture. This is an important matter. Too often novices take up citrus culture without the necessary information.

Secondly, what type of citrus is it intended to grow? Recent statistics show that lemon-trees should be planted with caution, as it appears that present plantings, adequately maintained, should give sufficient supplies for New Zealand's requirements for some time to come. The season of ripening can be extended, however, by the judicious planting of varieties such as the Eureka, Genoa, or Villa Franca. These varieties bear crops throughout the year rather than in the few months June to September, as characterized by the Lisbon.

Growing of Oranges.

With reference to oranges, the question of the variety and stock used is all important. It would be unfortunate for a purchaser to choose the orchard-site and to shelter the area and break it in only to find when choosing the trees that the soil was quite unsuitable for the stock which it was intended to plant.

Orange culture in New Zealand on a commercial scale may become an economic proposition provided the oranges produced excel or are equal to imported

fruit, but it would be neither sound nor reasonable to expect restrictions on imported fruit until local oranges of the quality and quantity desired are produced. There is a possible scope for the Seville (sour) orange and a large, thick-skinned lemon grown for peel purposes only, but the intending planter should make full inquiries from a reputable processing firm regarding market possibilities before engaging in extensive planting.

New Zealand grapefruit also offers some scope, provided a good strain, such as "Morrison's Seedless," is selected, and provided the beneficial effects of this valued fruit become better known and the fruit better distributed throughout the country.

Estimate of Expenditure.

Thirdly, estimate the necessary expenditure. It is not the initial outlay that has to be considered, but it is the final outlay before the orchard becomes self-supporting and interest-bearing and is returning the owner a livelihood. For the first time many citrus-growers have been endeavouring to assess their costs of production, and the results obtained are a revelation to many. It is not the cost of the land, the cost of the trees, the breaking-in of the land, or the planting of shelter that is important, as money spent on these items is money well spent; the intending purchaser must also realize that ten years will elapse before the best orchard is well established, and that only at about ten years after planting will the orchard be a real asset to the orchardist rather than an apparent liability.

No one more than fifty years of age should make a start with the growing of citrus fruit unless his means are adequate quite apart from fruitgrowing. For the younger man adequate capital is necessary, but farming experience is also desirable, and an apprenticeship of a year or two in a citrus orchard is practically indispensable in order to obtain the fundamentals of horticulture, without which one will have to buy one's experience. Never was the saying, "More haste less speed," more true than in the case of citrus culture. The foundations must be truly laid to ensure success.

The Established Orchard.

During the summer months every effort should be made to keep the soil in good tilth in order that the trees may withstand dry weather conditions. This operation may be done by constant hoeing around the trees or by mulching. All weed growth should be suppressed by disking or mowing in order to minimize the evaporation from all the leaf surfaces.

Begin the 3-per-cent. certified summer oil spray this month, and be sure that the spray is thoroughly applied, or losses will again occur through the ravages of red scale.

Citrus spray schedules are available on application to the local Orchard Instructor at any office of the Department.

—L. Paynter, District Supervisor, Auckland.

Viticulture.

Phylloxera-resistant Stocks.

(Continued from the November issue.)

The Berlandieri.

THE Berlandieri are natives of a hot climate, and can withstand extremes of heat. They grow mainly on the limestone hills of Texas, where few other plants prosper. This species is the most lime-resistant of all the American vines, and supports drought conditions very well, indicating its use in the production of stocks which have to contend with dry soils containing a high percentage of lime. They do not prosper in marly and/or wet, cold soils.

The affinity for viniferas is excellent. Grape crops of vines grafted on the Berlandieri or Berlandieri hybrids are improved both in quantity, quality, and appearance, and the ripening of the grapes is advanced.

During the first two or three years the Berlandieri and the hybrids develop their root systems more quickly than the upper part of the vines, which, however, catch up to that of other vines soon after that period and become very vigorous.

One Disadvantage.

A great impediment to the use of this otherwise desirable stock is that cuttings of the pure species root with difficulty, not more than from five to ten cuttings out of a hundred forming roots. For this reason the most suitable varieties of the species are maintained almost entirely for the production of hybrids, aiming at combining their valuable qualities with those of other species without the faults of either.

As with other hybrid vines, many thousands of seedlings have usually to be produced, grown, and tried out as stocks before a stock combining the desired qualities is obtained. A search among nursery records of the past has failed to reveal any mention of the introduction of any of the pure species of Berlandieri into New Zealand.

There are several groups of Berlandieri differing slightly in minor details. One of the best of those selected from these is known as Berlandieri No. 2 Resseguier.

Several hybrids of the Berlandieri in which the following characteristics are noticeable have been introduced: The tips of young, growing shoots are greenish-bronze coloured or golden-yellow; the leaves are entire, thick, rigid, hard, and fairly brilliant; stiff bristles on the ribs on the under-side of the leaf; the young shoots are green to wine coloured; and the older wood grey to brown and ribbed; the canes are long and relatively of even thickness from base to summit; it is of a creeping habit when no support available, and is a climber where support available.

Cordifolia.

This species is found growing throughout the centre of the United States of America from the great lakes to tropical Florida through many extremes of temperature and in rich and poor soils. It is of vigorous growth on various soils containing a high percentage of clay. It has a remarkable resistance to drought, but cannot stand much lime in the soil, in which case it suffers from chlorosis. It takes grafts easily but does not root well, although better in this respect than Berlandieri. It communicates to its hybrids its essential qualities—remarkable vigour, resistance to drought and to *Phyloxera*, being allotted eighteen points of resistance by Viala and Ravaz.

The principal characteristics, according to Viala and Pechoutre, are as follow: Very vigorous vine of a climbing habit;

trunk very thick; young wood of the year brilliant and cinnamon in colour; flat nodes; leaves entire, opening at once and of a reddish varnished appearance; adult leaves are heart-shaped, entire, and of medium size; petiolar sinus deep and narrow; teeth regular, large, and obtuse; upper-surface dark-green, shining, and smooth; under-surface of a lighter green and more varnished in appearance.

—J. C. Woodfin, Vine and Wine Instructor, Te Kauwhata.

Cool Storage Notes.

Notes for Private Cool-store Owners.

FRUIT cool stores are now emptying out, and many of them have already closed down for the season.

When the refrigerator has had its last run for the season all glands of stop and expansion valves should be tested with a spanner for tightness. The main delivery and suction stop valves of the refrigerator should be closed, to avoid filling the crank-case with liquid ammonia. A piece of white material should be tied to the delivery valve to indicate to the operator that the valve has been closed and must be opened again before starting up the refrigerator.

The main fuses should be removed from the switchboard, so that if the switch is operated the refrigerator is unable to start up. This is a precaution against some unauthorized person tampering with the starting-switch. With the delivery stop valve closed, the end of the cylinder would be forced unless a high-pressure cut-out had been fitted.

On closing down the plant for the season the first duty is to clean all fruit out of the chambers as soon as the temperature begins to rise above 45° F. The floors should then be thoroughly swept. This is the time to scrape and paint the ammonia coils. A second-hand bicycle-chain wound once around the pipe and pulled both ways is a quick and effective method of cleaning old paint and rust from coils. Aluminium paint is largely used for this class of pipe, and paints with a zinc base are also recommended.

Engineers are finding that waste refrigerator oil sprayed on to the coils with a spray-gun is most effective in checking rust, as it soaks through the rust, which falls off with the frost when the cooling begins. The only drawback to this method is that the rust is inclined to block the traps in the drain-pipes. The scraping and cleaning-out of rust is therefore recommended before spraying takes place. Waste refrigerator oil is also quick and effective in dealing with mould on lining-timber in cool-storage chambers.

Inspection of the Glands.

Before starting up for the next season's run, arrange with your refrigerating engineer to repack the gland of the main suction stop valve and to inspect the glands of the expansion valves. The refrigerator valves should also be overhauled at this time of the year. Oil-strainers are likely to block if not frequently inspected and cleaned. This also applies to scale-traps. The condensor-pump should be thoroughly overhauled, as it is a most important part of the refrigerating plant.

The fuses on the power switchboard should not be allowed to overheat. If this occurs, the electrician should be notified before further trouble develops.

Leave the chamber doors open during the shut-down period, to allow fresh air to keep the chambers fresh until they are to be used again for storage.

—A. Powell, Cool-storage Officer, Wellington.

Tobacco Notes.

Planting Out the Crops.

THE planting-out of tobacco crops in the Nelson District is almost completed. The weather experienced during November has been fine, with rather high winds—conditions which are not at all ideal for tobacco culture. A good "take," however, is apparent throughout the district. This is no doubt due to the fine preparation the fields have received prior to planting.

Most growers favour the planting of rows 3 ft. 8 in. apart, with the plants 22 in. to 24 in. in the row. This width of row suits the manure-sowing machine better than the 4 ft. rows recommended in the Departmental Bulletin No. 37. The machine places the fertilizer at the bottom of a furrow, which is then buried with the moldboards, forming a distinct ridge, upon which the tobacco is planted.

The amounts of manure used vary from 500 lb. to 1,000 lb. according to the quality of the soil. The method of ridging-in the manure confines it to the immediate use of the plant, and this should be sufficient to ensure the full development of the plant by the time it stands approximately 3 ft. 6 in. high, which should be reached by the end of January, when the tobacco leaf commences to ripen or turn yellow.

The concentration of a limited quantity of fertilizer near the roots of the plants brings about the desired condition at that time to cause the leaf to mature and to ensure the even curing in the barns. The reverse effect is caused by the broadcasting of manure over all the land. This forces the plant to forage for food over a wider area, and even then there is a great deal which is not assimilated. Every occasional shower of rain liberates a further supply of available plant-food, thus causing the plants to maintain a vivid green colour, which is not desirable at harvest-time.

—Charles Lowe, Tobacco Instructor, Motueka.

Vegetables, Small Fruits, and Flowers.

Contributed by the Horticulture Division.

Maintaining a Supply of Humus in the Soil.

UNDER a system of intensive cultivation the supply of decayed animal and vegetable matter in the soil—known as humus—is lost in a few years, chiefly by means of oxidation brought about by frequent cultivation. Not only are the plant foods lost, but the physical condition of the soil is seriously affected. Where a good supply of humus is present the soil is rich and friable and has remarkable water-retaining powers.

In its absence water is released rapidly and completely and the soil is reduced to harsh intractable clods, which, when broken down, form a dust in which there is little of that bacterial activity which is such an important feature in a really fertile soil. A few crops and other plants may be grown without humus if the physical condition of the soil is dealt with satisfactorily—a very difficult accomplishment—but in commercial cropping, and with the majority of garden plants, the maintenance of a supply of humus is indispensable to success.

In the plantation and shrubbery, planted in land in fair condition, the supply of humus is maintained reasonably well by means of the annual fall of leaves and litter. Further, in the orchard a herbaceous crop may be grown and ploughed or disked in with little interference to the management of the trees. It is in the management of crops of that large class of plants known as annuals that the difficulty chiefly arises where they are grown intensively.

Three Methods.

There appears to be three ways of dealing with the problem. The first is to grow one crop per annum, and as soon as that is cleared to sow the land down in a suitable cover-crop for ploughing under before a marketable crop is planted again. This system is adopted by some tomato-growers, who have carried it out for a number of years with fairly good results.

Where cropping is more intensive and it is necessary to harvest two or even three crops from the same land each season it is necessary to sow the land down in grass after about three years of this treatment and to graze it well with farm stock for a similar period before breaking it up again for cropping. During the grazing-period most of the plant diseases will be eliminated and humus will accumulate.

The third method is to apply dressings of well-cured manure as may be necessary. It should be clearly understood that artificial fertilizers will not take the place of this dressing, just as manure cannot do the work of artificial fertilizers. Both are indispensable to obtain the best results in commercial cropping over extended periods on the same piece of land.

Obtaining Supplies.

In a country with a mild climate where little stabling is done it is often difficult to obtain the necessary supplies of manure for the operation of this method. A considerable amount is available from pig-pens, fowl-houses, stables, cow-sheds, and shearing-sheds, but it is frequently allowed to become a nuisance instead of being treated as a valuable product.

Where straw is used for stabling the manure it can be stacked to allow it to cure before it is applied to the land. In its absence, as is very commonly the case, a pit protected from the weather is required, or a concrete bin with one side planked up. The material should be accumulated in this, spreading it carefully so that filling will be done evenly.

In addition to the materials mentioned, practically any kind of organic waste may be included as long as it will decay within a reasonable time. Specially useful are rough grass and weeds found growing along hedge bottoms and in waste and vacant places. Cut with a scythe or horse-mower before the plants form seeds, the material should be stacked with the manure, when bacterial action will soon reduce it to a decayed state suitable for the land. There is also the advantage in this way of keeping weeds under control, in which lies very many advantages.

Quality Improved.

In cases where the supply of humus in the soil is maintained by either of these methods and moderate quantities of artificial fertilizers are used with discretion the quality of the crop especially is improved, the danger of loss from disease is greatly reduced, and the land is kept in good heart.

Harvesting Onions, Shallots, and Garlic.

These crops, grown from sets planted in early spring, now begin to ripen. In the drier and cooler districts the operations of harvesting are not so urgent as in the warmer localities, especially where they are also humid. In such places the indications of ripeness are not so marked, and a second growth very quickly makes its appearance and spoils the keeping-qualities of the bulbs. Under such conditions it is important to watch the crop closely.

The first sign of maturity with onions is the plant falling over just above the bulb, and, in the case of shallots and garlic, the foliage begins to turn colour. By lifting the crops in fine weather soon after these indications are noticed the keeping-qualities of the bulbs can best be preserved. The bulbs are placed in windrows to dry off, and as soon as this is accomplished they are trimmed with shears and carted to a cool, well-ventilated shed to cure. During this process the bulbs harden up, and if it is done with care to avoid bruising the bulbs will keep for a maximum period if they are afterwards stored in a dry, cool, ventilated place.

Humid, close conditions ruin the quality of the bulbs and induce growth, if not

decay. They may be stored on slatted shelves, in open-mesh bags, or slatted cases. For choice bulbs the best method is to leave the dry tops on and braid them into strings and hang them up in a suitable place. Condition is thus maintained, and the life is greatly lengthened by this method. The shallots are of mild flavour, and are specially suitable for sauces and pickles.

Protecting the Late Potato Crop.

Troubles which sometimes threaten this crop are late blight (*Phytophthora infestans*) and potato moth (*Phthorimea operculella*). The late blight is a fungus disease especially prevalent during warm, humid weather, when it sometimes causes serious loss unless a Bordeaux spray is applied promptly and repeated at intervals of about two or three weeks, as may be necessary. A strength of 3–5–40 is often sufficient—that is, 3 lb. bluestone, 5 lb. hydrated lime or freshly slaked quicklime, and 40 gallons water. In more serious attacks a stronger mixture may be applied, as, for instance, 4–4–40, or even stronger still.

The plants must be well covered by means of a fine spray, taking special care to cover the under-side of the leaves. The first appearance of the disease is usually darkened areas on the edges of the leaves, which quickly spread until, when conditions are favourable to it, the whole plant is blackened. Some protection is afforded the tubers if the moulding-up is done well and the soil is brought up to a sharp ridge.

The potato moth is most active in dry, hot weather. Good moulding-up affords a measure of protection for the tubers. An application of arsenate of lead will also destroy the caterpillar larvæ before they penetrate the tissues of the plant. Both of these troubles are propagated by sowing infected seed or leaving infected tubers or potato waste lying about. By practising hygienic methods, good culture, and spraying as may be necessary there is usually little loss from these causes. As these diseases spread rapidly in storage, infected stocks cannot be held for any length of time, but must be consumed promptly.

Vegetables for Sowing and Planting.

Important crops for planting during January are savoy and red cabbage, kale, broccoli, cauliflower, leeks, and celery. Sowings may be made of turnips, globe beet, early carrots, and salads. In the colder districts spring cabbage is sown towards the end of the month, but elsewhere during February. In warm districts a sowing of peas (an early maturing variety) will provide a late crop, as also will dwarf beans. Spinach may be sown in a rich soil in a sheltered position.

Runner beans in a dry position, as on a wall, should be sprayed well with clean water during the evening and the ground kept well watered. If this is done there will be less complaint that the beans are not setting.

Treatment of Small Fruits.

As the harvest passes, brakes of small fruits should be cleaned up, or, if their career is finished, pulled out and burnt. There are far too many brakes of bush fruits aged and diseased on which sprays and manures are wasted; they are merely a source of infection, and are quite unprofitable. Before that stage is reached new plantings should be made on fresh land, so that when one crop has to be removed another comes into profit.

When the berries have been gathered the old canes of raspberries and loganberries which have borne the crop should be cut close to the surface of the ground and carried out and burnt. The new canes for cropping next season should then be sprayed with a suspension of arsenate of lead to protect them from the attack of the native bud-moth (*Carposina adreptella*), which often does serious damage by destroying the buds during autumn and winter. In black currants, also, the wood which has borne the crop should be cut low, just above a bud. The new wood produced this season will carry the next crop.

Land for planting berry fruits should be taken in hand as soon as the early potato or other crop is cleared, and the land thoroughly cleaned and prepared for planting strawberries as soon as the plants are available, or hard-wood plants about the month of May. The varieties should be chosen with the greatest care, choosing mainly those which have proved themselves in the locality, with perhaps, in addition, a few plants of a promising new variety for trial. The plants should be of medium size, well rooted, and free from disease. If they are not grown on the place they should be located and ordered now.

Selecting Trees and Shrubs for the Homestead Garden.

Furnishing the garden affords exercise for skill and taste if it is to be effective. It will be successful if it harmonizes with the surrounding landscape and generously provides the services expected of it both in utility and attractiveness. It is a mistaken approach to the problem to descend too quickly into the detail, instead, first of all, of deciding on the height, breadth, and situation of the main masses of vegetation. When these are realized and acted on such mistakes as having shelter-belts too high and too close to buildings will be avoided.

Not only must plants be of a suitable size and habit for the position they are to occupy, but it is also important that they be eminently adapted to the climate, soil, and situation in which they are to be planted. For instance, in decidedly high country most of our conifers thrive exceedingly well—spruce, fir, pine, cedar, larch, &c.—and also our principal deciduous trees, such as poplar, willow, oak, sycamore, birch, &c., which brighten the autumn months. They also grow well in the colder districts.

Flowering Shrubs.

In warmer localities, especially in those which are humid, the very large number of evergreen trees and shrubs naturally grow well. They include most of our native plants, which are not excelled in this class by trees from any country, and also the many species of cypress and eucalyptus.

Most of our flowering shrubs require a moist soil and a somewhat shaded position, but others suited to a dry, sunny locality include the Acacia varieties, the native *Pittosporum crassifolium*, *Spartium junceum*, Ceanothus varieties, Cistus ("gum" cistus), Cytisus (the "brooms"), Callistemon varieties, *Nerium oleander*, Albizzia varieties, Myoporum, Arbutus, Leptospermum, Romneya, Buddleia varieties, Dodonia, *Metrosideros tomentosa* (pohutukawa), and Tamrix species, and also Agave, Aloes, and succulent plants generally.

Further, these plants are mostly suitable for seaside planting where, if the ground is moist, the fan-palm, species of Chamaerops, may be included, and also in warm localities, the palms *Phoenix canariensis*, and *Washingtonia filifera*. In the poorer sandy lands by the seaside the Monterey pine and cypress (*Pinus insignis* and *Cupressus macrocarpa*) also flourish, in addition to *Pinus canariensis*, *P. maritima*, and *P. muricata*.

Selection of Plants.

Selections of plants based primarily on their suitability for the local soil and climate will always give the best results if they are suitably arranged—an operation which affords the finest field for the expression of good taste.

Planting schemes should now be carefully worked out, nursery stocks inspected, and the selection ordered for delivery as soon as they are available, which will be about May, which is the beginning of the planting season.

—Wm. C. Hyde, Horticulturist, Wellington.

Work for the Month in the Apiary.

Extracting Honey, and Uncapping.

EXTRACTING should now be in full swing in all districts in the Dominion. Where operations have been delayed for any reason, care must be taken to see that the bees are not crowded out, otherwise they will begin to loaf and the ultimate crop will be small. It is a good policy to extract twice during the season, but where the beekeeper prefers to leave the work until the end of the flow a close watch should be kept in order to provide ample room. This, however, can be done only where large numbers of spare combs are kept on hand.

It is during the season when honey is coming in freely that the beekeeper realizes that his most valuable asset, next to his bees, is a good stock of extracting-combs. Every effort should be made to get at least twenty spare combs for each hive in the apiary, and with this number always on hand the bees are not likely to be hampered for room.

Work of the Queen.

In the absence of plenty of drawn-out combs, the best plan is to keep the extractor going and thus prevent the bees from blocking the brood-combs. This usually happens unless ample room is provided, and as a result the queens are prevented from laying to their utmost, and the colonies dwindle. At no time during the working season should the work of the queen be hindered. Care must be taken at all times to see to this important item during the flow.

The honey is ready to extract when the combs are a half to three-parts capped, but great care must be exercised not to extract unripe honey. Some experienced beekeepers admittedly resort to extracting unripe honey, but its after-treatment requires great skill, and should not be attempted by the amateur or novice in any circumstances. Numerous instances have come under my notice where the practice of taking unripe honey has meant a total loss to the beekeeper.

Removing Honey from the Hive.

The usual practice followed when the time for extracting is at hand is to remove the frames one by one. If excluders are used, much time will be saved in picking over the combs. When the combs are taken from the hive, shake the bees in front of the hive, brush off the remaining bees, and place the combs in a super for removal to the honey-house. The combs should be covered with a cloth which has previously been placed in water containing a small percentage of carbolic acid.

Fig. 1.—Removing surplus honey.

When the season is at its height very little trouble will be experienced from robbers, but in case of a stoppage in the flow the above precaution is necessary. At all times the beekeeper should study his working-equipment, and this is highly important when removing the honey. It will be found convenient to provide a good barrow or truck for carrying at least two full supers. Much time and labour will be saved, and the tedious work of removing the honey will be facilitated.

Uncapping.

One of the important processes in the work of extracting is that of uncapping. There are several kinds of knives for the purpose on the market, but the stiff-bladed double-edged knife is usually first favourite. Two of these are necessary, and they must be stood in a pan of water which is kept boiling on a small lamp. As it becomes cold each knife is returned to the boiling water and the hot one takes its place.

Any contrivance used for an uncapping-can should be provided with a cross-bar, through which pass a screw or similar article, driven point upwards, to form a pivot on which to rest and revolve the combs. The comb should be placed with one end resting on the pivot and tilted slightly forward in order to allow the cappings to fall away from the comb. Uncapping should begin at the bottom of the comb and proceed with a sawing motion from side to side until the top of the comb is reached. The comb is then swung round on the pivot and the reverse side treated in the same manner.

Steam-heated Knife.

Only a thin sheet of wax should be removed, but it must be done thoroughly so that every cell is opened, and at the same time the top and bottom bars should be relieved of any burr-combs which may adhere to them. A contrivance much in favour with progressive beekeepers is the steam-heated knife. This is a knife with a soldered copper plate, so arranged that steam is forced through it from a rubber tube attached to the spout of a " bronchitis " kettle.

An escape-tube is fitted to the opposite side, and the knife is kept at a very high temperature all the time uncapping is proceeding, thereby obviating the work and trouble of continually plunging the knives into boiling water. For uncapping heavy, fully capped frames it has no equal, as an ordinary uncapping-knife becomes cold, as a rule, before half one side of a full comb has been uncapped. The cappings should be left to drain for two or three days, after which they should be gathered and melted, preferably in a solar wax-extractor. By this means the finest and purest wax of the season will be obtained.

Strainers.

It is not uncommon to find honey exposed for sale where proper care and attention has not been paid to straining at the time of extracting. Nothing deters the sale of extracted honey so much as a layer of wax particles, dead bees, &c., and it is surprising how few beekeepers take the necessary trouble to ensure that their product reaches the customer free from wax and other impurities. In no case should honey be run direct from the extractor into the containers; it should be properly strained.

It is the attention paid to this necessary detail that aids in the sale of the crop, and when honey is properly treated it readily commands a higher price. Fine wire-gauge strainers are usually adopted, but even these are not sufficient to remove the smaller wax particles. In order to ensure perfect condition it should be passed through good, fine cheesecloth before being run into the tank.

Use of Cheesecloth.

Cheesecloth strainers are excellent cheap, and easily made, and at the same time they can be readily cleansed. They remove everything but the smallest particles of wax, which should be finally disposed of when the honey is skimmed. This latter process is an important one, and should always be carried out before the honey is put up in marketable form.

Fig. 2.—Uncapping combs before extracting.

Treatment of Disease.

No effort should be spared to treat all colonies known to be affected with disease. If the work is delayed, the colonies will not build up to sufficient strength to winter safely. In no circumstances should the work be put off. Treat all infected stocks while the flow is on, and endeavour to winter none but clean colonies. There is a great risk of spreading the disease to clean colonies in the off-season, as robbing is more apt to break out.

"Keep your bees clean" should be the maxim of every beekeeper. Where any doubt exists as to the complete absence of disease in the apiary, an excellent plan is to mark all combs with the number of the hives to which they belong, so that when extracted they may be returned to the colony from which they were taken. If this plan is followed, the risk of spreading infection by means of wet combs is considerably reduced, even if any of the hives are diseased.

—E. A. Earp, Senior Apiary Instructor, Wellington.

Honey Marketing Regulations.

Levy Imposed by Means of Seal.

A. E. Morrison, Solicitor, Department of Agriculture.

By the Honey Board (Transfer of Powers) Order 1938, which came into force on the 11th November, the powers vested in the New Zealand Honey Control Board by the Honey Export Control Act, 1924, or conferred on the Board by any other Act or otherwise howsoever, are transferred to the Minister of Marketing, who may exercise the powers so transferred or delegate such powers to the Board or in accordance with the provisions of the Primary Products Marketing Act, 1936.

By the Honey Marketing Regulations 1938 a levy is imposed on all honey sold in New Zealand except honey sold for consumption in the bee-comb or sold by a producer to a consumer at his apiary or to a packer in a bulk container—*i.e.*, a package containing more than 10 lb. of honey—or delivered to and accepted by the Internal Marketing Division of the Primary Products Marketing Department.

Amount of Levy.

The amount of the levy is as follows :

Net Weight of Honey.	Amount of Levy.
8 oz. and under	½d.
Over 8 oz. and not exceeding 16 oz.	1d.
Over 16 oz. and not exceeding 2 lb.	1d.
Exceeding 2 lb.	1d., plus ½d. per lb.

The appropriate levy is to be affixed to the top or bottom of containers packed with honey by means of a special honey seal bearing a design depicting a bee in flight. These seals are obtainable for cash sale from the offices of the Internal Marketing Division of the Department at Auckland and Wellington.

On and after 1st December producers are required to see that the appropriate seal is affixed to all containers of honey sold to consumers or to a manufacturer and to all retail containers of honey sold to a packer or to any other person for resale. On and after the same date packers repacking for sale honey from bulk containers into retail containers—*i.e.*, packages containing honey not exceeding 10 lb. net weight—must affix the appropriate seals to the containers before the honey so repacked is sold or offered for sale.

To enable existing stocks in the hands of wholesalers and retailers to be sold without repacking to consumers, a period of three months is allowed for these stocks to be sold, but after 1st March next all containers of honey sold by retail must bear the appropriate seal prescribed by the regulations.

Inspection of Records.

The Minister of Marketing is empowered to withdraw from sale all seals for the time being issued and available for the purposes of the regulations, and to make available a fresh issue. The Minister may also repurchase any seals. Any officer of the Primary Products Marketing Department or any other person authorized by the Minister is given the right of entry to the premises of persons engaged in the business of storing or marketing honey in New Zealand for the purpose of inspecting the stocks of honey held and the books and records of such persons relating to the storage, sale, and purchase of honey.

It will be an offence against the regulations for any person to fail to observe or perform any duty cast upon him by the regulations, or to counterfeit any official seal, or to affix a counterfeit seal to any container of honey, or to remove without lawful justification or excuse any seal lawfully affixed to any container of honey, or to use on any container of honey any official seal that has previously been used as a seal in respect of the sale of any other honey. The penalty for a breach of the regulations is a fine not exceeding £200 in the case of an individual, and not exceeding £1,000 in the case of a company or other corporation.

Copies of the regulations, which are administered by the Internal Marketing Division of the Primary Products Marketing Department, may be obtained from the Government Printer, Wellington, price 3d. per copy, plus postage 1d., remittance with order.

Honey Exports.

The quantities and values of honey exported from the Dominion for the last five years ended 31st March are as follows :—

	Cwt.	Value. £
1934 ..	7,342	23,784
1935 ..	5,427	17,844
1936 ..	10,446	34,258
1937 ..	7,774	24,658
1938 ..	3,804	12,658

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Poultry-keeping Section.

Fresh Blood and External Parasites.

ON representations made by the New Zealand Poultry Board and the Poultry Producers' Federation, the Department decided, under certain conditions, to import some White Leghorns and Utility Black Orpingtons for its poultry-station at Wallaceville, where they could be kept under strict isolation for observation, &c. Stock and eggs from these birds will be available for sale to poultry-keepers who require fresh blood.

Last February Mr. E. Hadlington, Poultry Expert, Department of Agriculture, New South Wales, was asked whether his Department could supply some Utility Black Orpingtons, and in reply he stated that they could do so if we meant "Utility Black Orpingtons" which they now called "Australorps." Accordingly, six hens, two pullets, and two cockerels were imported from the New South Wales Department of Agriculture last June, and Mr. Hadlington, who selected the birds, wrote as follows :—

Mating the Birds.

"The birds are placed together in the coops as they should be mated—*i.e.*, the cockerel from Hawkesbury Agricultural College was placed with hens from Seven Hills, and the cockerel from Seven Hills with pullets from Hawkesbury Agricultural College. The cockerel from Hawkesbury Agricultural College is bred from an imported bird from England, mated with College pullets which averaged 234 eggs for twelve months. All the pullets laid over two hundred eggs. These were selected for good egg-size. The two pullets supplied you were checked for egg-size, and laid eggs not less than 2 oz. in weight. All the hens were tested for size of egg last year. Eggs of 2 oz. and over were laid during the period of testing. The hen with band ring No. 372 is the one which I selected as the most typical Australorp." (This bird is shown in Fig. 1.)

Some promising young stock is being reared from these birds, and a limited number of cockerels will be available for sale about March next at £1, £1 10s., and £2 each, according to selection. Poultry-keepers requiring a change of blood are advised to make application to the Poultry Overseer, Veterinary Laboratory, Wallaceville, per Private Bag, Wellington, C. 1. A consignment of two White Leghorn cockerels, three White Leghorn pullets, and a Langshan cockerel is being imported from England, and particulars of these will be published when they arrive.

Fig. 1.—This hen was selected by Mr. Hadlington as the most typical "Australorp," previously called "Utility Black Orpingtons," of those recently imported.

External Parasites.

Poultry are susceptible to infestation by a number of varieties of parasites, and the industry is subjected to heavy losses each year by the ravages of insects. One of the chief reasons for the expression, even at the present time, "poultry won't pay," is because of the failure to keep them and their houses free from vermin. These remarks apply to those who keep poultry but who are more or less uninterested and expect too much from their birds for the attention they give them.

Fig. 2.—Cockerel and pullets from Hawkesbury Agricultural College; cockerel bred from an imported bird from England.

The interested poultry-keeper realizes the great importance of keeping his birds and their houses in a clean and sanitary state, just as the successful orchardist knows that it is absolutely useless to expect profit from his orchard unless he does his part in keeping his trees in a clean and healthy condition.

Many Birds Lost.

Many chickens and young turkeys are lost each year through the ravages of insects, and many more are stunted and fail to develop into profitable birds because of the same cause. Pullets, if infested with vermin, will never grow as they should. They often fail to lay an egg until nine or ten months old, and even then they seldom produce a great number.

Disease may attack poultry which is free from vermin, but it is unreasonable to expect birds to be healthy if they are infested with vermin. The poultry-keeper who finds his birds going off colour or troubled with looseness of the bowels should first examine them and their houses for insects, for it is useless to give medicine to correct the bowel trouble if he does not first remove the real cause, which in many cases is vermin.

As insects play such an important part in the general health and productivity of poultry, every care is necessary, especially during warm weather, to guard against their infestation. Poultry-keepers must keep fighting these pests from one year's end to the other, for if they relax their vigilance for a while the parasites may get such a hold as to upset the plans for a whole year.

How They Attack.

Vermin attack poultry in different ways. Some suck the blood, others irritate the skin by scratching with their sharp claws, while still others form crusts or scabs.

The worst of all external parasites are those that suck the blood. Upon the digestion and assimilation of good food depends the bird's growth and productivity. The blood carries the nourishment to the different parts of the body, but if sucked as fast as it is made there is little chance of growth or production.

Those parasites which irritate the skin by crawling over it and clinging to it with their sharp claws, giving the birds no rest day or night, are the cause of much trouble. Although it is not necessary for the poultry-keeper to know the life-history and habits of all poultry parasites at the same time it is well for him to know a little about the worst of them in order that he may adopt the correct methods of fighting them.

For instance, some insects live continually on the body of the fowl, others visit the birds only at night, while others again live in the filth of the house, under stones, or in cracks and crevices. Some insects breathe through tubes in the sides of their bodies and can be destroyed with fine dust, while others have additional means of breathing and cannot be destroyed by dusting.

Dark, damp, or badly ventilated houses are breeding-grounds for poultry parasites of all kinds. It is stated by Dr. Salmon that the third generation of a pair of red mite may amount to one hundred and twenty thousand, and all this can take place in almost eight weeks. It will be seen therefore that these parasites are most prolific.

Most Troublesome Parasite.

Red mite (*Dermanyssus gallinae*) are of a light grey or whitish colour, unless filled with blood sucked from the fowls. They are the most destructive of all external parasites that infest poultry. They prick the skin and suck the blood. They are seldom seen on fowls during the day, but swarm over them at night. If plentiful, however, they will infest birds day and night.

These parasites must be kept in check at all costs. Dust will not destroy them, and a fluid should be used. If it is found that these parasites have obtained a hold, all litter and nesting-material should be removed and burnt, and the nests, walls, floors, and perches should be sprayed with a strong solution of sheep-dip, carbolic 5 per cent., kerol, creosote, or some other good insecticide.

The large chicken louse (*Ganioctis abdominalis*) is generally called the head-lice, because is usually confines its activities to parts of the head. This louse is about three times the size of the small, common fowl-louse. The best treatment for this pest is to rub a mixture of two

Fig. 3.—Stock known as "Australorps" in Australia recently imported from the Department of Agriculture, New South Wales; hens from Seven Hills, cockerel from the Hawkesbury Agricultural College.

parts of vaseline and one of mercurial ointment on the head and under the throat.

The common hen-louse (*Minapon pallidum*) is very small and slender, and is brighter in colour than other lice. If allowed to get a foothold they will hang in clusters on roosts or nests, and will quickly get on the hands of any one who happens to touch the nests.

Life-history.

As a rule, lice spend their entire life on birds. They lay their eggs (nits) and securely cement them to the barbs of the feathers. In from five to ten days, according to the weather, hatching occurs, and after several moults the young lice become mature and the cycle is repeated.

A good treatment is the application by a small paint brush of nicotine sulphate to the top of the perches just before the birds go to roost. As the eggs, or nits, are not destroyed by one application, the treatment should be repeated in about ten day's time. Most insects that infest birds can be destroyed or kept in check by dusting fine powder into the fowls' feathers. A suitable mixture for the purpose can be made up of equal parts of dry earth, lime, and flowers of sulphur.

"Scaly-leg."

"Scaly-leg" is caused by the scaly-leg mites (*Sarcoptes mutons*), which attack the unfeathered portion of the leg above the foot, and often the top of the toes. This minute parasite crawls under the scales of the legs, and there irritates the tissues for the purpose of obtaining food with its mouth parts. As a result of this irritation small blisters appear and, after a time, rupture. The serum dries and makes a minute scab, and as the parasites become more numerous they cause a piling-up of the scab. The itching is more intense at night, and the bird, if not treated, may become weak and even die.

A good treatment for this trouble is to soak the legs in soap and warm water, when the scabs may be removed, and then rub in a mixture of sulphur and lard. The treatment should be repeated in about ten days' time. If the houses are kept clean and dry and plenty of sunshine is allowed into them and the perches are dressed each week with a good liquid insecticide, such as waste car oil, kerosene, creosote, or similar material, the poultry-keeper need not fear parasites.

—C. J. C. Cussen, Chief Poultry Instructor, Wellington.

Slaughterings of Stock.

THE following return of slaughterings of stock at meat-export slaughterhouses and abattoirs for the six months May to October, 1938, inclusive, has been compiled by the Live-stock Division :—

District.	Cattle.	Calves.	Sheep.	Sheep, of which Ewes.	Lambs.	Pigs.
North Island.						
Meat-export slaughterhouses—						
Auckland	65,940	491,350	70,125	44,934	36,799	90,991
Poverty Bay - Hawke's Bay	20,891	35,648	131,506	44,907	127,323	12,861
Taranaki-Manawatu	40,166	216,118	62,061	31,308	120,827	56,658
Wellington-Wairarapa	16,992	24,207	89,947	33,504	104,242	12,769
Totals	143,989	767,323	353,639	154,653	389,191	173,279
Abattoirs	62,105	20,685	185,768	108,930	12,190	46,543
North Island totals	206,094	788,008	539,407	263,583	401,381	219,822
South Island.						
Meat-export slaughterhouses—						
Nelson-Marlborough	216	9,693	2,878	1,194	28,333	3,978
Canterbury	6,497	34,406	173,533	139,899	543,715	16,245
Otago-Southland	4,525	39,681	87,497	69,860	357,569	2,609
Totals	11,238	83,780	263,908	210,953	929,617	22,832
Abattoirs	31,269	7,172	135,547	69,041	8,849	13,268
South Island totals	42,507	90,952	399,455	279,994	938,466	36,100
Dominion.						
Meat-export slaughterhouses	155,227	851,103	617,547	365,606	1,318,808	196,111
Abattoirs	93,374	27,857	321,315	177,971	21,039	59,811
Grand totals	248,601	878,960	938,862	543,577	1,339,847	255,922
In addition, the following stock were slaughtered at rural slaughterhouses during the six months ended 30th September, 1938	44,240	1,292	107,144	Not known	3,807	14,079
Same period, 1937—						
Meat-export slaughterhouses and abattoirs	261,981	924,320	753,887	408,273	1,449,145	295,444
Rural slaughterhouses for six months ended 30th September, 1937	45,301	1,117	107,370	..	3,077	14,285
Same period, 1936—						
Meat-export slaughterhouses and abattoirs	203,520	915,594	788,774	429,838	1,628,350	278,600
Rural slaughterhouses for six months ended 30th September, 1936	44,858	1,065	106,293	..	3,872	13,313

Export of Eggs.

DURING the past egg-export season, which has just closed, a total of 7,759 cases, representing 232,770 dozen eggs, were shipped from New Zealand to London, as compared with 2,338 cases (70,146 dozen eggs) during the 1937 season.

The quantities shipped from the respective centres were as follows: Auckland, 1,053 cases; Canterbury, 3,525 cases; Otago, 3,181 cases.

The cases were of thirty dozen eggs each.

—C. J. C. Cussen, Chief Poultry Instructor, Wellington.

Examination for Chick-sexing.

TWO candidates qualified for first-class certificates at a chick-sexing examination held at the Wallaceville Poultry Station on Friday, 14th October.

They were Mr. L. Doughty, who sexed two hundred White Leghorn chickens in twenty-four minutes five seconds, with an accuracy of 96·5 per cent., and Mr. J. C. Jamieson, who sexed two hundred White Leghorn chickens in twenty-six minutes two seconds, with an accuracy of 96·5 per cent.

—C. J. C. Cussen, Chief Poultry Instructor, Wellington.

N.Z. Federation of Young Farmers' Clubs.

Edited by S. Freeman, Dominion Organizing Secretary.

Successful Nelson District Field-day.

D. Merry, District Secretary, Nelson.

In common with progress made in other rural districts, the Young Farmers' movement in the Nelson District has experienced a year of record achievement. Each of the four main clubs in the instructorate has held its field-day during the year, and these have been an attraction both to neighbouring clubs and to older members linked with the Farmers' Union movement.

The progressive Dovedale Club held a dog trial for competition among its members some weeks ago. This was an unprecedented success, although the wintry weather made conditions anything but pleasant. On 28th October the Dovedale Club again came to the fore with a well-organized and well-attended field-day. This was held on the property of Mr. N. A. Win, Dovedale. The club chairman, Mr. A. Thorn, welcomed the numerous visitors and introduced the speakers, each of whom is prominent among the farming community of the district and well versed in the particular subject of address.

Fig. 1.—Mr. W. D. Dron, Hope, lecturing on the Jersey cow.

Fig. 2.—Mr. J. H. Jordan, Hope, describing the good points of a Clydesdale.

Series of Lectures.

The opening lecture was given by Mr. G. Field, of Wakefield, who detailed the points characteristic of a good Southdown. Mr. J. H. Jordan, of Hope, continued with an address on the desirable features of the Romney breed. Mr. Jordan then spoke on farm horses, with particular reference to the Clydesdale, and illustrated his remarks by referring to an animal of fine type owned by Mr. Win.

Mr. W. D. Dron, of Hope, described the features of a good Jersey cow. Together with conformity to type, he stressed the necessity for regular herd-testing. Mr. Dron gave a second talk on the Tamworth and Berkshire breeds of pigs.

Mr. J. Mead, of Hiwipango, described the breaking-in and training of a young sheep dog, emphasizing the necessity for kindness but firmness. He also

demonstrated how a good sheep dog should work, his demonstration meeting with appreciation from the spectators.

The final address of the afternoon was contributed by Mr. D. Merry, Department of Agriculture, who spoke on the Department's work in plot-manuring trials, one small trial being inspected. Mr. Merry also spoke of the benefits to be derived from sowing only the best seed. An inspection was made of an excellent stand of subterranean clover on Mr. Win's property.

Proposed Tour.

At the conclusion of the addresses the speakers were thanked by the club chairman. The club secretary then outlined the proposed tour of the South Island in March–April next of the combined Nelson district and Marlborough clubs, and stated that every effort was being made to raise the necessary funds. The visitors willing response considerably augmented the club's travelling fund.

An enjoyable afternoon tea provided by Mrs. Win and willing helpers brought to a conclusion a most successful field-day.

Apiti Club Wins Debating Shield.

THE final of the debating contest among the seventeen Young Farmers' Clubs of the Manawatu district, held in Palmerston North on 20th October, was won by the Apiti Club. The subject was: "That the Development of Primary Industries is of Greater Benefit to New Zealand than the Development of Secondary Industries."

Apiti was represented by H. G. Viles (leader), A. Viles, and A. Cowan, and J. Woodley (leader), D. Lynch, and J. Hight spoke for the Fitzherbert Club. Mr. H. J. Lancaster, president of the Young Farmers' Clubs, presided. Mr. W. J. Viles, of Apiti, and father of two of the members of the successful team, who had donated the shield for competition, presented the trophy to the winners.

Social Aspects.

Opening the debate, Mr. H. G. Viles dealt with the social aspect from the economic point of view. It became largely a question, he said, of city life versus country life. Health was better in the country, and lack of outlook in the city caused the predomination of the herd instinct, as also did the lack of recreation facilities. City life was an affair of many acquaintances but few friends, whereas the reverse was the case in rural life. In addition, the country developed a leader who was prepared to listen to all sides of a question, while town life bred a leader of the mob type. Farming was not only a business but was also a way of life, and family life would be adversely affected if New Zealand were to give preference to secondary industries.

Machinery was the symbol of secondary industry, said Mr. Woodley, speaking for the negative. After detailing the various natural resources of New Zealand in metals and industrial power, he said that one of the greatest problems was unemployment, and that would be solved more quickly by secondary industrial development. Lack of population, too, was the cause of some alarm, but secondary industry would give rise to a beneficial policy of immigration, and the newcomers would be provided with certain work on their arrival.

It was necessary to become more self-contained in the event of war. A blockade, for example, of New Zealand would make it difficult for the country to carry on with its present industrial resources. The primary industries were highly developed and yet provided work for only 500,000 people. Examining the market situation, Mr. Woodley claimed that farming development would not lead to increased prosperity.

Basis of Trade.

Mr. A. Viles said that exchange was the basis of all trade. New Zealand, with her fertile soil and mild climate, was

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particularly suited to primary industries, and interlocked with these were a number of secondary industries processing primary products. Other secondary industries were carried on only under a vicious system of protection. Woolpacks and woollen-mills were cited as examples. Economically they could make a better deal by exporting primary products in return for manufactured goods.

Mr. Lynch contended that the British markets were not a bottomless pit, and that if this were ignored the future would be seriously endangered. Secondary industries had to be developed, he said, thus allowing an immigration policy which would give security against invasion. Manufacturing would assure the people of employment, and New Zealand could make articles to satisfy all its requirements. They had successfully assembled cars, but they must build them themselves. The same could be said of road-making machinery. Where there was employment, there was prosperity.

Resuming the case for the affirmative, Mr. Cowan said that admittedly secondary industries provided more work, but that was not everything. More labour for less result produced a wrong situation. Self-sufficiency was only the product of war-scared nations like Italy. A tariff amounted only to a Government bounty unless it could, in the not too remote future, become self-supporting, but many of New Zealand's industries had no such prospect.

Mr. Hight claimed that New Zealand could manufacture goods equal to those imported. New Zealand's boots, woolpacks, &c., were quite up to the standard of foreign articles. A paper mill was being built, and flax would assist this industry. The result of the licensing poll showed that the breweries would have to be enlarged.

The leaders for both sides replied briefly.

Close Margin between Teams.

Remarking that there was a margin of only 5 points between the sides, the judge, Mr. A. C. Buist, said that the teamwork of the affirmative had been the deciding factor. Both sides had done remarkably well, and he congratulated them on their fine showing.

Mr. E. J. Fawcett, Acting Director-General of Agriculture, congratulated the speakers on their efforts in the contest, and pointed out the value of debating as a means of improving methods of expression. He was pleased to see the progress being made in all sections of the Young Farmers' Clubs.

Following supper, dancing was enjoyed by the club members and friends who had attended the debate.

Seven-a-Side Football Tournament at Alexandra.

A SEVEN-A-SIDE rugby football tournament was held at Alexandra on 24th September. Some bright football was seen, and a very enjoyable day was spent by members of the clubs in Central Otago.

The tournament, which was arranged by the Central Otago District Committee, was the first of the annual contests for the J. Wilson Challenge Cup presented by Mr. J. Wilson, Chairman of the Upper Manuherikia Club.

Seven teams took part in the tournament: Alexandra A and B, Arrowtown, Roxburgh, Upper Manuherikia A and B, and Upper Clutha. The tournament was played in two sections, Upper Clutha winning one section and Upper Manuherikia A winning the other. In the final between these two teams Upper Manuherikia played an exceptionally good game and left no doubt as to their superiority.

The Results.

Results were as follow:—

Section 1.—Alexandra A, 8; Upper Manuherikia B, nil. Roxburgh, nil; Upper Clutha, 10. Alexandra A, 11; Roxburgh, 3. Upper Manuherikia B, nil; Upper Clutha, 14. Alexandra A, nil; Upper Clutha, 8. Roxburgh, 6; Upper Manuherikia B, 6.

Section 2.—Alexandra B, 3; Upper Manuherikia A 8. Arrowtown, 8; Alexandra B, nil. Upper Manuherikia A, 18; Arrowtown, 5.

Following the tournament a dinner was held at the Bendigo Hotel, Alexandra. The Chairman, Mr. R. Kinnaird, in welcoming the visitors on behalf of the District Committee, said he hoped the next tournament would be equally successful.

During the evening the following toast list was honoured: "The King." Mr. H. Perriam proposed the toast of "The District Committee," and congratulated that body on the successful tournament. Mr. J. Mun suitably responded. Mr. M. Kinaston proposed the toast of "The Referees" (Messrs. T. Sunderland, Campbell, and G. Hesson), and in replying both Messrs. Sunderland and Campbell commented on the clean, friendly spirit in which the games had been played and the pleasure they themselves had derived from refereeing them. A toast to "Other Sporting Bodies" was proposed by Mr. C. Rowley, and replied to by Mr. B. Brown.

Presentation of Cup.

The presentation of the J. Wilson Cup to the Upper Manuherikia Club was made by the Chairman, who congratulated the team on its victory. He expressed the district's appreciation of Mr. Wilson's generous act in giving the cup, and regret that the donor had been unable to witness the first tournament, as he would have realized the true value of the cup in assisting the social and recreational activities of the Y.F.C. and in cementing friendships between members of the various clubs.

Mr. D. Armitage, in accepting the cup on behalf of the Upper Manuherikia A team, expressed pleasure at his club being the first to hold the cup, and congratulated the other teams on the hard, clean games that had been played.

A final toast to "The District Secretary" (Mr. G. G. Calder) was proposed by the Chairman, and suitably replied to. A pleasant evening closed with the singing of "Auld Lang Syne."

Y.F.C. Broadcasts from 2YA.

THE following is the programme of Y.F.C. lecturettes to be broadcast from station 2YA, Wellington, up to the end of January next:—

Tuesday, 27th December: "Grading and Instruction of Pork." Mr. A. Mikkleson, Kairanga Y.F.C.

Tuesday, 10th January: "Culling the Ewe Flock." Members of the Marton Y.F.C.

Tuesday, 24th January: "Age-marking of Sheep." Mr. I. Fraser, Kairanga Y.F.C., and Mr. M. C. Holmes, Otaki-Te Horo Y.F.C.

Planting Shelter-belts.

W. McNOE, Lawrence Club.

THERE are probably few better ways of improving one's property than by the planting of shelter-belts or the filling in of rough corners with trees. Trees can be planted successfully from May until the spring provided they are protected from stock. There are, however, a few simple precautions to be taken in the planting if one is to get good results.

A method which is very simple and yet has been quite successful is merely heeling in the young trees. All that is necessary is to make a deep cut with a spade and raise the sod enough to insert the tree, firming the ground around it afterwards. From then onwards the only attention needed is the occasional cutting-back of the grass to prevent it from smothering the trees until they are big enough to look after themselves. While, with this method, the growth of the trees for the first few years is slow, practically every tree grows.

Ploughing the ground and working it up is quite a common practice before tree-planting. This method is very good provided the first spring is a good one. In this district we sometimes get the two extremes—sometimes it is very wet, and sometimes it is very dry. This has a great effect on young trees planted in cultivated soil, for in a wet season the trees are standing in a puddle most of the time, whereas in a dry season the open soil prevents the trees from getting the necessary moisture.

Trees are becoming more valuable every year, as most of the bush country is being cut out. Tree-planting, in addition to the shelter it gives your homestead and fields, is a very valuable asset to your farm in view of the difficulty sawmillers experience in obtaining trees that are easy to transport to their mills.

Chou Moellier in the Seddon District.

J. LANGRIDGE, Seddon Club, Marlborough.

IN starting this article I would like to explain that I know very little of chou moellier other than what I have learnt from growing the one crop as an experiment, the results of which I propose to describe.

This crop, which was grown on my father's farm at Blind River, is the only crop of chou moellier I have seen in the Awatere district. Following a usual practice, an area of about 2 acres was ploughed and worked for mangels. This ground was along the foot of a hill, and received fair drainage. Also, it had been down in grass for about twenty years. Mangels were sown on 28th August, but because of heavy rains the strike was a failure. The ground was later worked up, and chou moellier was drilled on 7th October. The seeding was too heavy, about 2½ lb. per acre being sown. About 2 cwt. of manure was drilled in with the seed.

Very Good Strike.

The strike was very good, but because of lack of time no thinning out was done. The growth in the spring was good, the plants being about 18 in. high before the weather became dry. The white butterfly attacked it badly, and at the end of the summer only the stalks remained. The autumn rain produced a big growth, and by the beginning of the winter a wonderful stand of green-feed was the result.

The crop of chou moellier which was used as winter feed for sheep.

A start was made using it on 25th June by carting it out to sheep, and sufficient was carted out with some hay to carry 500 sheep for three weeks. The method was then changed. A small area was reserved, and the chou moellier was carted out to 100 hoggets and ewes until the middle of August. The remainder was fenced in small sections, and the mob of 500 sheep were turned in, a small quantity of hay being fed with it.

This was continued until the beginning of August, when a small line of hoggets was turned in to clean up what remained. This will give some idea of the quantity of feed obtained off an area of under 2 acres. The plants grew about 5 ft. high and some of the stalks were up to 4 in. in diameter.

Relished by the Sheep.

The sheep ate it readily, and seemed to like the stalks as well as the leaves, for there was absolutely no waste.

The sheep were mostly ewes heavy in lamb, and did very well on the chou moellier. Actually, they improved in condition, and a wonderful lambing resulted. Ewe hoggets also did very well, as did a line of ram hoggets

We were very pleased with the crop and the results obtained from feeding sheep on it. We consider it to be far superior to mangels, and intend growing bigger areas of it in the future. In conclusion, I would advise any one growing winter feed to try an area of this valuable feed.

Among the Clubs: Reports on Activities.

AT the request of a number of members the name and address of the club secretary is included in this section beside the name of each club. It is considered that this information will be of value, as it will encourage secretaries to correspond with one another on club matters, &c., and will also assist prospective members and others to make contact with clubs in the various districts. The names of the District Secretaries are also indicated.

A number of clubs are at present in recess because of seasonal farming activities, and consequently their secretaries have no news to report. This applies particularly to the South Island, where harvesting and other operations make it necessary for clubs to close down during the summer months. The same applies, in a lesser degree, to clubs in the North Island, many of which close down for one to two months because of haymaking, shearing, &c.

Western Southland.

(District Secretary: A. Stuart, Department of Agriculture, Invercargill.

Dipton (Secretary: J. R. Palmer, Dipton).

Lochiel (Secretary: A. R. Forbes, Otahuti R.D., Invercargill).

Thornbury (Secretary: G. O. Fallow, Section 4, Wright's Bush R.D., Invercargill).—Mr. L. Harbord, Department of Agriculture, gave an address on "Life at Lincoln College," and also a talk on "Ragwort."

Woodlands (Secretary: S. J. Hargest, Rakauhauka, Invercargill).

Wyndham (Secretary: J. Winter, Florence Street, Wyndham).—Request from the A. and P. Society for members to assist in the show ring on Show Day, and also to be attached to the judges with the idea of gaining instruction in judging, &c. At the meeting ten-minute speeches were given by members, the subject being "What I would do if I were Boss on a Farm."

Eastern Southland.

(District Secretary: W. Faithful, Department of Agriculture, Gore.)

Crookston (Secretary: D. Rea, Crookston).

Kelso (Secretary: A. Crossan, Kelso).

Moa Flat (Secretary: L. Sutton, Moa Flat).

Otama (Secretary: C. C. Dickson, Box 35, Gore).—Discussion on the Y.F.C. Judging Competitions to be held at the Dunedin Summer Show; general club activities were also discussed.

Waikaka (Secretary: W. Kerse, Box 1, Waikaka).

South Otago.

(District Secretary: A. F. Greenall, Department of Agriculture, Balclutha.)

Clinton (Secretary: F. G. Corbett, Ashley Downs R.D., Clinton).—Address by Mr. Garfield Anderson, Principal, South Otago High School, on "Education for the Farmer."

Lawrence (Secretary: W. McNoe, Waitahuna).—Impromptu debates, the speakers being R. Greeves, A. Cameron, T. Cunningham, R. Labes, R. Walker, and W. McNoe.

Milton (Secretary: D. Tweedie, care of Mr. D. Clarke, sen., Moneymore, Milton).—Interesting address by Mr. J. A. Alberts on "A Trip around Australia." At the previous meeting a talk was given by Mr. Grace on "Pasteurized Milk."

Stirling (Secretary: Ron Anderson, Box 19, Stirling).

Central Otago.

(District Secretary: G. G. Calder, Department of Agriculture, Alexandra.)

Alexandra (Secretary: Peter Weaver, Earnscleugh, Alexandra).

Arrowtown (Secretary: C. B. Anderson, R.D., Gibbston, Arrowtown).—Discussion *re Journal of Agriculture*, &c. Lecture by Mr. G. G. Calder, Department of Agriculture, on "High-country Grasses." The speaker dealt fully with his subject, and also mentioned the different types of grasses being experimented with by the Department on the Pisa Flat.

Manuherikia (Secretary: D. Armitage, Lauder R.D., Becks).

Roxburgh (Secretary, E. J. Dunlay, Roxburgh E.).—Arrangements for annual social. Lecture by Mr. S. Frew, Orchard Instructor, Department of Agriculture, on "Six-legged Pests, and How to Control Them."

Upper Clutha (Secretary: W. A. Kane, Box 5, Hawea Flat).

Dunedin.

(District Secretary: S. H. Saxby, Department of Agriculture, Dunedin.)

Middlemarch (Secretary: James Howell, "Stonehurst," Middlemarch).

Palmerston (Secretary: I. T. Smith, Bushey Road, Palmerston South).—Debate with the Dunedin Junior Chamber of Commerce, the subject being "That the Introduction of Machinery has done more Harm than Good." The speakers were as follows: Dunedin Junior Chamber of Commerce (negative), Mr. French, Mr. Stannage, and Mr. Neil; Palmerston Y.F.C. (affirmative), J. Lowen, N. Wright, and F. Clearwater. Mr. McRae acted as judge, and gave the decision in favour of the visitors by a fairly wide margin.

South Taieri (Secretary: A. McKenzie, Berwick, Dunedin).

Waikouaiti (Secretary: S. Heckler, Waikouaiti).

West Taieri (Secretary: John Young, jun., "Brantsfield," Allanton).—Mr. R. Fougere, Valuation Department, Dunedin, gave an instructive lecture on "How Land is dealt with in order to Arrive at its True Value."

North Otago.

(District Secretary: T. A. Sellwood, Department of Agriculture, Oamaru.)

Duntroon (Secretary: A. Francis, Duntroon).

Enfield (Secretary: J. Porteous, care of Mrs. W. Malcolm, Enfield R.D., Oamaru).

Five Forks (Secretary: W. J. Kingan, "Black Cap," 15D R.D., Oamaru).

Hampden (Secretary: R. Douthwaite, Post-office, Hampden).

Papakaio (Secretary: L. D. Gray, Papakaio).

Tokorahi (Secretary: Ken Cook, Livingstone, Otago).

Upper Waitaki (Secretary: J. H. McCaw, "Cliffside," Hakataramea).

Waitaki-Hilderthorpe (Secretary: W. R. Paton, Pukeuri, Oamaru).

South Canterbury.

(District Secretary: C. C. Leitch, Department of Agriculture, Timaru.)

Albury (Secretary: S. Askin, Mount Nessing, Albury).

Arno (Secretary: R. P. Lindsay, Waikakahi R.M.D., Waimate).

Cannington-Cave (Secretary: R. McKenzie, Cave, Timaru).—Talk by Mr. H. Roberts (club member) on "Lucerne." Addresses, &c., at meetings previously unreported include the following: "Diseases in Sheep" (Mr. E. J. Lukey, Government Veterinarian), "Preparing Wool for the Market" (Mr. R. Grant), "Farming Conditions and Problems in Australia" (A. Scott, club member), "Pasture Control" (Mr. C. C. Leitch, Department of Agriculture), and "Insect Pests" (Mr. J. Millar, Department of Agriculture).

Fairlie (Secretary: B. J. O'Neill, Allandale, Fairlie).

Geraldine (Secretary: R. L. Volckman, Te Moana, Geraldine).

Hunter (Acting-Secretary: E. R. McConnell, Hunter, R.M.D., Waimate).

Maungati (Secretary: J. F. Collier, "Otaio Gorge," Maungati R.M.D., Timaru).

Milford (Secretary: Geo. Crossman, Milford, via Temuka).

Morven (Secretary: L. Paul, Waikakahi R.D., Waimate).

Pleasant Point (Secretary: A. D. Talbot, Pleasant Point).—Instructive address by Mr. A. B. Struthers, Timaru, on "Farm Book-keeping." At the previous meeting two debates were held, the subject being "That Town Life has more to offer than Country Life," and "That a System of Mixed Farming is better than Pastoral Farming in the Pleasant Point District." The first debate was won by the negative and the second by the affirmative supporters.

Southburn-Lyalldale (Secretary: R. Gray, St. Andrews, Timaru).

Waihaorunga (Secretary: W. B. Armstrong, Pentland Hills R.D., Waimate).

Mid-Canterbury.

(District Secretary: V. P. Boot, Department of Agriculture, Ashburton.)

Ashburton (Secretary: J. J. Burrows, Chertsey, Ashburton).—Field-day at Ashburton; demonstrations including Milking Shorthorns Ryelands, and English Leicesters. The speakers were Messrs. R. J. Lowe, Withee, and G. H. Bill. There was a total attendance of forty, including visiting members and farmers, &c.

Hinds (Secretary: D. G. Tait, Ashburton-Lowcliffe R.D.).—Arrangements for a debate at Methven. Members were congratulated on winning the stock-judging competition at the Ashburton A. and P. Show; a cup donated by Mr. White will be held for six months each by B. J. Simmons and D. G. Tait. A discussion took place on debating, and some very helpful hints were given by senior members. At the previous meeting prepared speeches were given by members on the following subjects: "Irrigation," "Is the Header-harvester economically suited to New Zealand Conditions?" and "Is the Horse more payable to the Farmer than the Tractor?"

Mayfield (Secretary: W. Logan Doyle, Mayfield R.D., Ashburton).—Team selected to take part in an inter-club debate at Methven as follows: R. M. Milligan, S. Sewell, and W. L. Doyle. The members of the Farmers' Union were entertained at a card evening.

Methven (Secretary: T. A. Richards, Box 78, Methven).—A motion of sympathy with the relatives of the late Mr. C. H. Wilson was carried, and members stood in silence as a mark of respect. Mr. R. J. Low, Advisory President, gave an outline of the conditions decided upon for the stock-judging competition at the Ashburton A. and P. Show, and stressed the importance of as many members as possible taking part. The results of the competition would be considered in selecting a team to represent the club at the Christchurch Show. An address entitled "Some Aspects of Farm Economics in the Ashburton County" was given by Mr. J. Fleming, M.Agr.Sc., who described characteristics of the various soil types in the county and the practical points of farm management on each type. A general discussion followed.

Christchurch.

(District Secretary: L. W. Blackmore, Department of Agriculture, Christchurch.)

Darfield (Secretary: James W. Stewart, Box 34, Darfield).

Dunsandel (Secretary: A. T. Wright, Dunsandel).

Ellesmere (Secretary: C. S. Tod, Hanmer Road, Irwell R.D.).—Arrangements for a field-day on the Agronomy Division's grounds, Lincoln. Impromptu speeches (two minutes) by all members present.

Hororata (Secretary: J. T. Thwaites, Hororata).

Ladbrooks (Secretary: M. G. White, Couch Road, Little River).—Address by Mr. W. H. Montgomery, Little River, on "Farming in Mexico and Other Countries."

Springston (Secretary: L. Harris, care of M. E. J. Harris, R.D., Springston).

Teddington (Secretary: Alan H. C. Nutt, Motukarara, Canterbury).

West Melton (Secretary: G. G. Calder, Halkett R.M.D.).—Lecture by Dr. M. C. Franklin, Lincoln College, on "Nutritional Losses in Sheep." The speaker showed charts, and exhibited samples of internal parasites taken from lambs.

North Canterbury.

(District Secretary: A. S. Nash, Department of Agriculture, Rangiora.)

Amberley (Secretary: C. Lavis, R.M.D., Sefton, Rangiora).

Amuri (Secretary: T. H. Belton, Waiau).

Cust (Secretary: C. J. Patient, care of Mr. R. G. Wolff, Horrelville-Rangiora R.M.D.). Field-day at Amberley on Mr. Bowler's property. Demonstrations included the following: Clydesdale horse (Mr. Wyllie), Shorthorn cow (Mr. Peach), and English Leicester sheep (Mr. Sidey, Lincoln College). A judging competition on English Leicesters was won by Mr. Croy, of Oxford, who holds a silver challenge cup for the year; this was presented at lunch-time by the donor, Mr. P. Parish. In the afternoon members attended the opening of the Amberley limeworks by the Right Hon. G. W. Forbes, M.P. A table-tennis tournament and farewell to N. Shilleto, former club treasurer, was held at a later date.

Hawarden (Secretary: F. K. Forrester, "Heatherdale," Hawarden).

Oxford (Secretary: N. W. Skurr, "Beck Bank," Carleton, Oxford).—Lantern lecture by Rev. Mr. Fowles on "The North Island of New Zealand." Selection of team for stock-judging at Christchurch Show.

Scargill-Omihi (Secretary: H. G. T. Dunbar, care of Mr. D. S. McKenzie, Happy Valley, Motunau).—Arrangements for field-day. Address by Mr. Bevan, Lincoln College, on "The History of Farming in Australia and Tasmania." The speaker spent ten years with the Department of Agriculture in Tasmania.

Marlborough.

(District Secretary: D. R. Wilkie, Department of Agriculture, Blenheim.)

Blenheim (Secretary: Colin R. Laidlaw, "Craigieburn," Blenheim).

Flaxbourne (Secretary: D. F. Matthews, "Glenfield," Ward).

Seddon (Secretary: A. L. Ferguson, Seddon).

Nelson.

(District Secretary: Mr. D. Merry, Department of Agriculture, Nelson.)

Dovedale (Secretary: Irvine S. Win, R.M.D., Wakefield).—Address by Mr. C. H. Smith, Dairy Instructor, on "Some aspects of the Dairying Industry." A field-day was held on Mr. N. A. Win's property, forty-one members and visitors being present. An illustrated report of this activity appears in this issue.

Motueka (Secretary: Alan E. Wratt, "The Grange," Motueka).

Motupiko (Secretary: R. J. Mead, Motupiko).

Moutere (Secretary: S. Smith, care of Mr. H. R. Holdaway, Lower Moutere).

Wairarapa.

(District Secretary: N. Lamont, Department of Agriculture, Masterton.)

Alfredton (Secretary: N. Napier, "Strath Eden" R.M.D., Eketahuna).—Visit from Dominion Organizing Secretary, Mr. S. Freeman, who addressed members on the Y.F.C. organization and exhibited some sound films.

Ballance (Secretary: J. F. Bremner, Ballance, Pahiatua).—Visit from Dominion Organizing Secretary, Mr. S. Freeman. Members of the Mangatainoka Club were present.

Carterton (Secretary: Ian Thompson, Carrington, Carterton).—Visit from Dominion Organizing Secretary, Mr. S. Freeman.

Eketahuna (Secretary: E. M. Wright, Nireha, Eketahuna).—Arrangements for a debate, and also for a visit by South Canterbury touring party.

Featherston (Secretary: M. Benton, Kahutara Road, Featherston).—General business and impromptu debate.

Greytown (Secretary: N. Gates, Greytown).

Mangatainoka (Secretary, K. R. Pryde, Ruawhata R.D., Mangatainoka).

Martinborough (Secretary: D. Ross, Box 44, Martinborough).—Visit from Dominion Organizing Secretary, Mr. S. Freeman, who addressed members on the Y.F.C. organization and exhibited sound films.

Masterton (Secretary: K. Donovan, 58 Opaki Road, Masterton).—Visit from Dominion Organizing Secretary, Mr. S. Freeman. At the previous meeting Mr. J. E. Duncan, Wool Instructor, Department of Agriculture, gave a lantern lecture on "Wool."

Pongaroa (Secretary: T. E. Hall, Pongaroa).—Discussion of topics suggested by members as follows: "Water Troughs," "Sledges," "Horse-couplings and Check-reins," and "The Handling of Valuable Sheep."

Tinui (Secretary: J. Lancaster, "Waiawa," Whareama, Masterton).

Manawatu.

(District Secretary: C. S. Robinson, Department of Agriculture, Palmerston North.)

Apiti (Secretary: F. V. Viles, Apiti, Feilding).—Lecture by Mr. E. A. Madden, Grasslands Division of the Plant Research Bureau, on "Pastures in Relation to their Districts."

Bunnythorpe (Secretary: R. A. Stewart, Ashhurst Road, Bunnythorpe).

Colyton (Secretary: R. J. Shortall, Spur Road R.D., Feilding).—Six members volunteered to act as stewards in the National Y.F.C. Shearing Competition to be held at the Palmerston North A. and P. Show. Lecture by Mr. C. J. Hamblyn, Department of Agriculture, on "Pasture Establishment." At the previous meeting an address on "Shearing" was given by Mr. E. W. Barnett, of Halcombe.

Feilding (Secretary: R. E. G. Mason, Reid's Line, Feilding).—Address by Mr. Jamieson on "Cropping in General." The speaker dealt very fully with his subject, and also touched on grasses and grassing-down.

Fitzherbert (Secretary: N. James, Linton).—Discussion on club finance and raising of funds, &c. Arrangements for debate with Women's Institute.

Halcombe (Secretary: J. Curtis, Mount Biggs R.D., Feilding).

Johnsonville (Secretary: N. Bryant, Oharui Valley, Johnsonville).—Discussion *re* shearing competition; arrangements for club dance. Talks by two members of the Otaki-Te Horo Club, Messrs. Holmes and Galloway, on "Fencing" and "The Care of the Breeding Ewe," respectively.

Kairanga (Secretary: R. Buchanan, "Lockwood," Kairanga, Palmerston North.)—Address by Mr. A. C. Morton, Massey College, on "General Sheep-farm Management"; the numerous important aspects of the subject were fully discussed.

Kimbolton-Kiwitea (Secretary: H. H. Beard, "Stockwood," Kimbolton).—Lecture by Mr. J. Hill Motion, M.R.C.V.S., on "Diseases in Sheep."

Levin (Secretary: G. F. Gimblett, Box 80, Levin).—Discussion *re* bacon competition. Talk on "Defence" by Sergeant-Major Holmes, Defence Department.

Oroua Downs (Secretary: W. Jarvis, Himitangi).

Otaki-Te Horo (Secretary: R. W. Hillas, Box 35, Otaki Railway).—Field-day on Mr. C. C. Holmes' property, Otaki. Demonstrations included the following: Southdowns (Mr. L. J. Staples); mole-drainage (Mr. C. J. Hamblyn, Department of Agriculture); manurial trials (Mr. G. S. Robinson, Department of Agriculture); Romneys (Mr. M. C. Holmes).

Paraparaumu (Secretary: H. W. Holland, Box 35, Paraparaumu).

Pohangina Valley (Secretary: A. Macdonald, "Wahipai," Ashhurst).—Lecture by Mr. L. J. Wild, Principal, Feilding Agricultural High School, on "Agriculture Abroad."

Rangiotu (Secretary: H. Lucas, Mangawhata R.D., Palmerston North).

Rangiwahia (Secretary: S. J. Thompson, Rangiwahia, via Feilding).

Rongotea (Secretary: F. Dear, Kopane R.D., Palmerston North).

Shannon (Secretary: V. Guerin, Kingstone Road, Shannon).—Impromptu talks by each member present on his idea of "The Most Interesting Job on the Farm."

Waituna (Secretary: J. H. Old, R.D., Feilding).—Lecture by Mr. L. J. Wild, Principal, Feilding Agricultural High School, on "Agriculture Abroad."

Whakarongo (Secretary: R. G. Scott, jun., Whakarongo R.D.).—Arrangements made for conveyance of members to a field-day to be held at Borthwick's freezing-works. Lecture on "Top-dressing" by Mr. G. S. Robinson, Department of Agriculture.

Woodville (Secretary: H. G. Goldsworthy, No. 2 R.D., Woodville).

Wanganui.

(District Secretary: A. R. Dingwall, Department of Agriculture, Wanganui.)

Bulls (Secretary: F. J. Thorby, Brandon Hall Road, Bulls).—Address by Mr. Mackay, solicitor, on the transfer of land and other legal matters of interest to farmers.

Hunterville (Secretary: P. S. Weston, Vinegar Hill, Hunterville).

Marton (Secretary: A. B. Marshall, "Greenbank," Marton).—Report by Chairman on recent field-day held in Marton; judging competitions arranged for Marton A. and P. Show. Arrangements for club dance, and also for meeting South Canterbury Y.F.C. touring party. Address on "Fat Lambs" by Mr. J. Caithness, Marton.

Taihape (Secretary: S. V. Smith, Taoroa, Taihape).

Waimarino (Secretary: A. G. Mountfort, Raetihi Road, Ohakune).—Arrangements for club dance; talk on "World Affairs" by Mr. Purdon. A field-day was held on Mr. J. E. Deadman's property, Ohakune, where Mr. T. Ranford demonstrated on Jersey cattle.

Westmere (Secretary: C. Goldstone, 21 College Street, Wanganui).

South Taranaki.

(District Secretary: J. E. Davies, Department of Agriculture, Hawera.)

Alton (Secretary: W. Saggers, Alton, South Taranaki).

Eltham (Secretary: A. Jenkins, Rawhitiroa, Eltham).

Hawera (Secretary: C. J. Washer, Inaha, Hawera).—Field-day on the properties of Messrs. J. C. Best, Eltham, and S. Morgan, Mangatoki. Demonstrations included "Romney Sheep" by Mr. Best, and "Jersey Cattle" and "Dairy Type" by Mr. Morgan. Afternoon tea was provided at Mr. Best's homestead.

Kaponga (Secretary: Geo. Gordge, Palmer Road, Kaponga).

Lowgarth (Secretary: J. T. Sultzberger, Lowgarth).

Pukengahu (Secretary: R. Bremer, Wingrove Road, Stratford R.D.).—Arrangements for stock-judging at Hawera and Stratford A. and P. Shows; return debate with Eltham; stewards for coming Stratford Show. Address by Mr. E. W. Haybittle on "Sheep, their Management and Care throughout the Seasons." Two field-days held, one on Mr. C. Clemow's farm, Cardiff, and the other on Mr. D. Hyndman's farm, Ngaere. Mr. Clemow demonstrated on dairy cows, giving an exposition of different breeds and their characteristics, and Mr. Hyndman demonstrated on Berkshire, Tamworth, and Large Black pigs, detailing type and qualifications, &c.

Waverley (Secretary: W. P. Matthews, Box 26, Waverley).

Whakamara-Mokoia (Secretary: I. Buckrill, Whakamara, Taranaki).—Address by Mr. S. Wrigley on "The Essential Points of a Dairy Cow."

Whenuakura (Secretary: W. Honeyfield, Whenuakura, Patea).—Addresses on the major points of stock-judging—"Sheep and Cattle" (Mr. S. McRae), and "Pigs" (Mr. W. Parsons). At previous meetings an interesting talk was given by Captain W. E. Barnes on "Experiences at Sea in Sailing Ships," and a travel talk by Mr. F. Parsons. At a recent field-day on Mr. W. Parsons' farm demonstrations on sheep, cattle, and pigs were given by Mr. S. McRae and Mr. Parsons, and an address on "Bees and Bee-keeping" by Mr. H. F. Dodson, Apiary Instructor, Department of Agriculture.

North Taranaki.

(District Secretary: G. A. Blake, Department of Agriculture, New Plymouth.)

Cardiff (Secretary: W. Brunton, Cardiff, Stratford).—Teams selected for stock-judging at Stratford A. and P. Show. Talks by Messrs. A. O'Sullivan and A. Johnson on "Bacon Pigs" and "Dairy Cows" respectively.

Hillsborough-Tarurutangi (Secretary: N. T. Sampson, Hillsborough, New Plymouth).

Karawaka (Secretary: L. Oliver, Lepperton).—Teams selected to represent the club in the stock-judging competitions at the Stratford A. and P. Show. Address by Mr. C. J. Harris on "The Points of a Bacon Pig and General Pig Management." Members also attended at the invitation of the Farmers' Union a lantern lecture entitled "Impressions of Farming Overseas," given at Lepperton by Mr. E. Bruce Levy, Director of the Grasslands Division, Plant Research Bureau.

Okau-Tongaporutu (Secretary: Owen Collins, Tongaporutu, via Waitara).—Discussion on future club activities. Short talks by members as follows: "Farming in the Gisborne District" (J. O. Sullivan), "Dehorning Cattle" (N. Bishell), and "The Chain System in the Freezing Works" (D. Rattenbury). A field-day was held on Mr. H. E. Collins' property. Mr. Collins demonstrated the points of a dairy cow, and each member judged two groups of four pedigree Jersey cattle. The results were: O. Collins, 1; A. Stratton, 2; and A. Jimmieson, 3.

Toko (Secretary: L. J. Kilsby, Huiroa R.D., Stratford).

Urenui (Secretary: K. Phillips, Waitoitoi).

Southern Hawke's Bay.

(District Secretary: J. K. Palmer, Department of Agriculture, Hastings.)

Dannevirke (Secretary: K. Kilford, Private Bag, Dannevirke).

Norsewood (Secretary: B. Anderson, R.D., Norsewood).

Onga Onga (Secretary: Clive W. Masters, Box 18, Onga Onga).

Takapau (Secretary: Maurice N. Tilley, Kurinui, Takapau).—Arrangement for club field-day. A debate was held, the subject being "Tractor *v.* Horses." The speakers were as follow: L. Thomas and E. Taylor (tractor), W. Craig and M. Tilley (horses). The debate resulted in a draw.

Tikokino (Secretary: H. Eddy, Tikokino).

Northern Hawke's Bay.

(District Secretary: R. P. Hill, Department of Agriculture, Hastings.)

Meeanee (Secretary: Lester L. Griffiths, Meeanee, Napier).—Motion carried in favour of holding a sports meeting. Mr. J. Guthrie outlined the general form of the activity, and stated that the idea was to foster the Y.F.C. movement and at the same time increase the club membership. He offered his paddock, which was the most suitable and most central, for the sports meeting. Officers and committee were elected, and the programme of events drawn up.

Nuhaka (Secretary: N. J. Alexander, Nuhaka).

Putorino (Secretary: E. Smyth, Raupunga).—Discussion on minutes of recent Northern Hawke's Bay District Committee meeting. Address by Mr. V. Long on "Farm Management." Five-minute talks by club members, D. McLean, M. Johnstone, and E. Smyth, on their experiences and knowledge gained while acting as stewards, &c., at the Hawke's Bay A. and P. Show. Teams were selected to take part in a debate at the next meeting, the subject to be "That Grassland Farming pays better than Ploughing and Cropping."

Wairoa (Secretary: W. G. Brownlie, Frasertown, Wairoa).—Arrangements for second anniversary dance; preliminary arrangements for fat-lamb judging. Lecture by Mr. R. P. Hill, Department of Agriculture, on "Spring Sowing and Pasture Management."

Poverty Bay.

(District Secretary: E. M. Bates, Department of Agriculture, Gisborne.)

Gisborne (Secretary: G. W. Smith, Box 246, Gisborne).—Arrangements for a "weight estimating" competition to be held at the A. and P. Show. Address by Mr. R. De Costa on "Insurance."

Te Karaka (Secretary: A. D. N. Manuel, Te Karaka, Gisborne).—Lecture by Mr. E. J. Simmons, Government Veterinarian, on "Treatment of Wounds in Farm Animals."

Tolaga Bay (Secretary: M. Robison, Tolaga Bay).—Lecture by D. Jones (club member) on "Fencing." Impromptu speeches by all members present.

Waiapu (Secretary: B. McCosh, Ruatoria).

Taumarunui.

(District Secretary: J. M. Hopkins, Department of Agriculture, Taumarunui.)

Taumarunui (Secretary: L. G. Smith, Patunga, Taumarunui).

Te Kuiti.

(District Secretary: K. M. Montgomery, Department of Agriculture, Te Kuiti.)

Aria (Secretary: E. A. Riddle, Aria).—Lecture by Mr. I. L. Johnston, Government Veterinarian, on "Parasites in Sheep"; Mr. Johnston exhibited specimens of parasites found in sheep, and answered a number of questions.

Otorohanga (Secretary: C. G. Murphy, Te Kuiti Road, Otorohanga).—Visit by Mr. C. Walker, Secretary, Auckland Y.F.C. Council. A debate was held, the subject being "Horses *v.* Tractors." The speakers were as follow: D. Phillips, P. Evans, P. Dowd, and A. Bell (horses); and S. Tye, G. Neustroski, S. Smith, and L. Hewer (tractors). Mr. Walker acted as judge, and gave the award to the team supporting the tractors. The first club debate was held at the previous meeting, "Ensilage *v.* Hay" being the subject selected. The speakers were H. Murphy, J. Croasdale, and R. Rountree (ensilage), and R. Palmer, C. Murphy, and E. Muir (hay), the ensilage supporters winning by a small margin.

Eastern Bay of Plenty.

(District Secretary: C. R. Taylor, Department of Agriculture, Whakatane.)

Edgecumbe (Secretary: R. Strachan, care of Mr. G. W. Mexted, R.D., Whakatane).—Arrangements for final of Bay of Plenty debate, Waimana *v.* Paengaroa, to be held at Edgecumbe.

Opotiki (Secretary: I. O. Grant, Woodlands, Opotiki).—Arrangements for a rally at Ruakura, a field-day at the Opotiki Dairy Co.'s piggeries, and a cricket match against Waimana.

Taneatua (Secretary: W. Garlick, Taneatua).—Discussion regarding a proposed tour in 1939.

Waimana (Secretary: C. R. White, Waimana).—Arrangements for cricket season; election of captain; selection of team, &c. Discussion *re* radio talks, stock-judging competitions, &c., and proposed 1939 tour. Address by Mr. J. Reenberg, Supervisor, Bay of Plenty Pig Council, on "The Sow and her Treatment."

Western Bay of Plenty.

(District Secretary: A. V. Allo, Department of Agriculture, Bay of Plenty.)

Katikati (Secretary: R. F. Walford, "Foxbro," Katikati).—The November meeting was held in the Parish Hall, Katikati. Dr. Keenan, of Katikati, gave an address on "The History and Life on Nauru and Ocean Islands." The speaker detailed the treatment of the raw rock phosphate and the shipping of it to New Zealand and Australia. He stressed the value of these islands to the Dominion, and the enormous wealth that had been obtained from them. The club Chairman, Mr. D. B. Thomas, moved a vote of thanks to Dr. Keenan for his address, the motion being carried by acclamation. The evening concluded with a dance, which was particularly well supported. Supper was served by Mrs. W. Johnson and the members of the W.D.F.U.

Omokoroa (Secretary: E. Emeny, Omokoroa).—Arrangements for a card party. Lantern lecture on "Top-dressing" by Mr. A. V. Allo, Department of Agriculture. This lecture was the first of two dealing with the same subject; the second part will be given at a subsequent meeting.

Paengaroa (Secretary: A. F. Walter, Rongakawa R.M.D., Te Puke).—Invitation from Te Puke Jersey Club to a field-day (demonstration and judging competition). Mr. K. Chapple, M.A., made suggestions to improve still further the standard of debating. Mr. Chapple's coaching was largely responsible for the club's success in the Bay of Plenty Debating Contest. The Paengaroa team won the western zone debates, but were beaten in the final for the shield by Waimana Y.F.C., the winners in the eastern zone. Mr. Chapple further offered to instruct members in elocution; he considered that this would, with some members, be of possibly greater assistance than debating in teaching them to express themselves. Mr. Chapple was accorded a hearty vote of thanks. Mr. A. V. Allo, Department of Agriculture, gave a lantern lecture on "Top-dressing," which was greatly appreciated. A field-day was held on the property of Messrs. D. and S. Ross, Rangiura Road, which took the form of an inspection of the extensive and up-to-date piggeries and demonstrations on pigs by Mr. W. E. Bowen. Afternoon tea was served at the homestead. The club Chairman, Mr. E. Blackmore, expressed the club's thanks.

Tauranga (Secretary: W. R. Hamilton, R.D., Tauranga).

Te Puke (Secretary: A. D. McNaughton, Box 42, Te Puke).

Waihi (Secretary: B. Thornton, Waitekauri, Waihi).—Arrangements for a debate, and also a dance. Lantern lecture by Mr. A. V. Allo, Department of Agriculture, on "The Certification of Potatoes and Rye-grass Seed." At the previous meeting Mr. Allo gave a lantern lecture on "Top-dressing."

Rotorua.

(District Secretary: C. S. Dalgliesh, Department of Agriculture, Rotorua.)

Horo Horo (Secretary: T. D. Kingi, Box 174, Rotorua).

Ngakuru (Secretary: J. E. Willoughby, Ngakuru R.D., Rotorua).

Putaruru (Secretary: S. G. Penwarden, Putaruru).

Rotorua-Ngongotaha (Secretary: E. L. Lewis, 58 Malfroy Road, Rotorua).

Waikato.

(District Secretary: J. F. Shepherd, Department of Agriculture, Hamilton.)

Huntly West (Secretary: J. H. Furness, Ruawaro, Huntly R.D.). Arrangements for a field-day. Lecture by Mr. C. Bailey on "The Farmer's Difficulties."

Kakepuku (Secretary: H. W. Budden, Te Kawa R.D.).—Debate, "Town Life *v.* Country Life," three members taking each side. The side supporting country life won by 13 points to 7. An address was given by Mr. R. Naylor, Government Dairy Instructor, on "Cream Grading."

Matamata (Secretary: S. K. Duxfield, Station Road, Matamata).

Matangi (Secretary: J. R. Ranstead, Matangi).

Te Aroha (Secretary: J. P. Hunt, Box 58, Te Aroha).

Te Kowhai (Secretary: Ivan Porter, Te Kowhai R.D.).

Auckland.

(District Secretary: J. E. Bell, Department of Agriculture, Auckland.)

Mangatawhiri (Secretary: G. Quick, care of Mrs. C. Peach, Maramarua).—Advantage is to be taken of the Country Library Service, and an application is to be made for the loan of books. Arrangements for a debate at the next meeting. Address on "Mammitis" by Mr. A. E. Kidd, Bacteriologist. The speaker stressed the need of prevention, and enjoined the young farmers of to-day to approach the disease from that angle. The address was listened to with great interest, and at the close Mr. Kidd answered numerous questions put by both junior and senior members of his audience.

Whangarei.

(District Secretary: E. B. Glanville, Department of Agriculture, Whangarei.)

Matarau (Secretary: Ian D. Bodle, Matarau R.D.).—Discussion *re* district Y.F.C. tour. Mr. H. Woodyear Smith exhibited a film entitled "Grass."

Maungakaramea (Secretary: C. W. Timperley, Maungakaramea).—Lecture by Mr. Brown on "Herd-testing." The speaker explained the various methods used and the advantages of herd-testing generally. At the previous meeting a lantern lecture was given by Mr. H. Woodyear Smith on "Strains in Grasses."

Dargaville.

(District Secretary: E. H. Arnold, Department of Agriculture, Dargaville.)

Arapohue (Secretary: J. T. Studholme, Mititai, Dargaville).—Address by Mr. W. A. Beattie, Supervisor, Northland Pig Council, on "Pigs and their Management." A field-day was held at the Arapohue Cattle-dip. Mr. T. H. Hankin, Government Veterinarian, gave an address on "Diseases of Live-stock," and conducted a post-mortem examination of a condemned beast.

Marohemo (Secretary: J. Petrie, Maungaturoto Railway R.D.).

Ruawai (Secretary: E. Barnes Walker, Parahi, Matakohe).—Field-day on Mr. L. E. Ambury's farm, Ruawai. The grass and clover species and strain trial areas were inspected. Mr. E. H. Arnold, Department of Agriculture, demonstrated the value of certified seeds and the use of fertilizers on the Ruawai Flats, and Mr. Ambury dealt with the advantages of timothy and strawberry clover in wet soils. There was an attendance of thirty-four, including many older farmers.

Kaitaia.

(District Secretary: E. Moss, Department of Agriculture, Kaitaia.)

Broadwood (Secretary: B. Rogers, Broadwood, Kokianga).—Arrangements for club debate. Lecture by Mr. E. Moss, Department of Agriculture, on "Facial Eczema: Its Effect on Stock and Methods of Prevention by Farm Management."

Herekino (Secretary: Dave McKeay, Herekino).—Address by Mr. W. A. Beattie, Supervisor, Northland Pig Council, on "Pigs, and the Work of Pig Clubs."

Kaeo (Secretary: R. Brighouse, Kaeo).

Kaitaia (Secretary: H. C. Hooper, Box 26, Kaitaia).—Arrangements for a field-day. Mr. G. Bell gave a brief talk on the combined field-day at Morewa freezing-works. A welcome was extended to Mr. C. M. Whatman, who was the leader of the New Zealand Y.F.C. party which toured Australia early in the year. Mr. Whatman gave an interesting address on the Australian tour, and was accorded a hearty vote of thanks.

Oruru (Secretary: O. F. Packard, R.D., Mangonui, Oruru).

Umawera (Secretary: K. R. Webber, Umawera, Kaitaia).—Minutes of Auckland Council meeting discussed. Remit to be forwarded to the Kaitaia District Committee suggesting that a district field-day be held in July to judge hay, ensilage, and crops. General discussion on seasonal work and farm stock generally, the principal speakers being A. Harrison, K. Harrison, G. Butler, W. Postlewaight, G. Carman, and H. Gray. Mr. E. Moss, Department of Agriculture, assisted in the discussion. There was a full attendance at this meeting, and one intending member was also present. A field-day was held at the Morewa freezing-works on 11th November, and was attended by members and visiting members from Kaitaia and Kaeo Clubs, as well as older farmers. The killing of pigs, examination for disease, &c., was demonstrated. Mr. W. A. Beattie, Supervisor, Northland Pig Council, showed carcasses sent in by club members, and gave their grading results.

Health Notes for the Farm.

Contributed by the Department of Health.

Let Health Accompany You on Your Holiday.

THE spirit of holiday-making is abroad, and at this season of the year probably none of us ever outgrows a quickening of the pulse as we look forward to a change from the ordinary routine of life and a way of escape from overwork and ennui. An individual who is harassed by the recurring problems of everyday life tends to lose his true sense of proportion and to become unable to concentrate upon his work or to find a pleasure in it. In other words, he becomes stale. His remedy is to take a holiday and crowd into a few days many pleasurable experiences denied in the ordinary routine of life.

It does a person good to get away from the same old kitchen stove, the shop or office, the cow-shed, the school-room, or whatever the daily occupation or environment may be, even if it be for a day or a month. No one need be ashamed in taking a necessary holiday, provided it is a healthy one; it is the decadent type of holiday which is a stupid waste of a precious opportunity.

A Complete Change.

As a general rule, for a holiday there should be a complete change from the ordinary environment, and a person who lives near the sea should, if possible, go inland, while the inland dweller should go to the coast. Having chosen the location, what is done afterwards depends largely on temperament and taste.

Love of the sea is ingrained in the blood of our people, and even many who dwell by the sea still choose seaside resorts for their holidays. The beach is incomparable, with its opportunities for bathing, for exposure to the sea and the wind, and for easy walking exercise. It should be remembered, however, that while sunlight is one of nature's most beneficient agents, injudicious sun-bathing may be not only harmful, but even dangerous.

In large institutions in England and on the continent in which sun-bathing is carried out as part of the regime and under medical direction extreme care is taken to prevent ill effects, and the skin of the patients is exposed to the direct rays of the sun only by degrees and for gradually increasing periods. It is most important, then, that bathers should refrain from too sudden and prolonged exposure of the body on hot beaches. This applies particularly to those with fair hair and skin lacking in protective pigment.

Hygienic Camping.

Camping is becoming increasingly popular, and provides a cheap and simple holiday with practically an unrestricted choice of locality. The very popularity of this type of holiday, however, demands the observance of certain elementary rules on the part of the campers in the interests of themselves and those who come after them. The sanitary requirements of a good camp include provision of safe water, protection of food from dust, flies, &c., and the satisfactory disposal of all waste matter.

The organized camping-grounds established or approved by local authorities provide for all these, and in such cases the duties and responsibilities of the camper are simplified. These camps can only be established according to the provisions of the Camping-grounds Regulations 1936. However, many will elect to camp in more remote places, where they themselves must assume direct responsibilities in these matters.

The camp-site should be carefully selected. Swamps and stagnant pools which are likely to be breeding-places for mosquitoes should be avoided. Shade is desirable, but a place should be chosen which will be reached by the early morning sun and to which the breezes have clear access. The sides of the tent should be raised during the day when weather permits, so as to expose the tent-site and contents to the purifying influences of sun, wind, and fresh air. Waterproof ground-sheets are invaluable articles of equipment to rest on by day or to put beneath the mattresses at night. Mosquito-netting may be advisable where insect pests abound.

The Camping Diet.

The diet of campers is necessarily of a simple nature, but it should not be too concentrated, and must contain a liberal supply of milk, fresh vegetables, and fruit. Water from wayside streams may or may not be safe, according to its source and whether it has been exposed to human pollution. It is safer to boil the water, and this precaution must always be taken unless it is from a source which is known to be uncontaminated.

Meat may be kept fresh and free from flies by placing it in a safe constructed of butter-muslin stretched over iron hoops and hung from a tree in a cool spot. Butter may be kept cool in an unglazed pottery dish covered with wet muslin.

Milk should be carried separately and kept cool. When babies are bottle-fed, great care should be exercised in the preparation of the milk on arrival in a new district during a holiday. On this matter the advice of the local doctor or Plunket Nurse might be sought. Immediately a baby refuses to take its food or shows signs of intestinal trouble it is wise to obtain expert advice.

Camp wastes should be disposed of in such a manner that they will not pollute the soil, contaminate water-supplies, attract rats and mice, or furnish a breeding-ground for flies. A spade is an

essential article of camp equipment. A good motto is "burn and bury." The true lover of nature will always leave a scene as clean and beautiful as he found it.

Exercise in the Open Air.

Exercise in the open air is a recognized aid to health, and one of the principal objects of the holiday is to become physically fit. In all cases exercise should be regular and appropriate to the individual. Moderation should be the key word; excess may be harmful. Those of mature years should not indulge in violent athletic activity during their holidays unless they are already fit and in good training. It should be remembered, also, that even the youngest and most ardent holiday-maker is better for proper rest and adequate sleep.

Clothing during holiday should be based on comfort. The requirements for hot weather are looseness of texture, lightness of weight, and the capacity for air circulation. The movement of air over the body is of great assistance in promoting a feeling of wellbeing, in imparting tone to muscles, and in stimulating circulation and body processes generally.

Guard Against Accidents.

Unfortunately, the holiday season is not free from risk. Every year the sea and rivers take their toll of victims who, through carelessness or over-confidence, bathe in unsafe waters. Holiday-makers must exercise proper care, as non-observance of common-sense precautions only result in disaster. Children, particularly, should be properly supervised. The road also claims its victims, but enough has been said in other quarters to emphasize the importance of ensuring that the rules of the road are obeyed and that every vehicle is safe from point of view of brakes and steering-gear.

Minor accidents are always liable to occur, and the holiday-maker should carry a simple first-aid outfit. A few sterile bandages, some cotton wool, boracic lint, a common antiseptic, some simple ointment, and tincture of iodine should be enough for the purpose.

The Troublesome Mosquito.

All cuts should receive immediate attention. Mosquito-bites may be a source of intense annoyance. There are various repellants, of which one of the most useful is oil of citronella. This should be lightly smeared over exposed surfaces of the body. Where bites have occurred the irritation may be allayed by bathing in a weak solution of water containing sodium bicarbonate, commonly known as baking-soda. Tincture of iodine may be painted on subsequently to prevent development of infected sores.

When camping or picnicking, lighted matches or cigarette ends should not be thrown on dry grass or bush, as this is one of the most common means of starting a fire which might have a disastrous consequence. The greatest care should be taken with spirit lamps.

Insurance Against Illness.

In conclusion, it should be remembered that a well-spent holiday can be regarded as a sound investment and an excellent insurance against illness. The motoring enthusiast need not let his car deteriorate his muscles, for it can be used to carry him to the starting-point of new, delightful walks. There is no tonic like exhilaration. Let the holidays be something more than a question of what is for breakfast, dinner, and tea. Draw close to nature. Heed the call of the sea, or the countryside and the mountain-tops, for in their presence the body tends to grow strong, a natural vehicle of health, and the mind is invigorated so that to live is keen delight.

THE HOLIDAY RUSH

Reserve Your Train Seats!

Booking promises to be very heavy for the "rush period" of summer holidays.

Plenty of people now believe that it is well worth while to make sure of seats. Therefore, persons who leave things to chance, run a risk of disappointment.

When you include train travel in your holiday plan you give good riddance to worry about yourself or luggage.

Obey the Impulse, To-day!

The Farm Home and Kitchen.

Contributed by the Association for Country Education.

New Ways for Serving Rhubarb.

WHILE rhubarb is properly classed with vegetables, because it is the stalk of a plant, its acidity and flavour cause it to be used as a fruit.

Just now it is making a welcome addition to the rather limited variety of fruits on the market. Inexpensive and plentiful, it makes a very palatable contribution to our spring menus, and, for those who are fond of it, it can be very easily bottled for use during the winter.

Bottled Rhubarb.

There is more than one good way of bottling rhubarb for sauce.

(1) Pack the rhubarb as tightly as possible into a jar. Fill the jar to overflowing with a hot, heavy syrup made of twice as much sugar as water by volume and cooked until the syrup forms a thread when dropped from a spoon. Adjust the rubber and the lid, but do not seal the jar. Sterilize the jar for fifteen minutes on a rack in a covered pan of boiling water. The water should be at least 1 in. over the top of the jar. Seal the jar, remove it from the water, invert it on a cloth, and allow it to cool. Store it in a cool, dark place. Rhubarb bottled in this way makes good sauce or filling for pies.

(2) In a pint jar place a layer of rhubarb 1 in. deep, then a layer of sugar ½ in. in depth, and alternate in this way until the jar is filled, having a layer of sugar on top. Adjust the rubber and the lid, and boil the jar in a water bath for twenty-five minutes. Remove it from the water, seal the jar, invert it, and allow it to cool. Store it in a cool, dark place. This makes a richer sauce than does the first method.

(3) Rhubarb will keep if sealed in clean jars with cold water only.

Rhubarb Juice.

Cut the rhubarb into small pieces, add just enough cold water to cover it, and simmer it until it is very soft. Strain the juice through a jelly bag. To each quart of juice add one cupful of sugar. Heat the juice until the sugar is dissolved, skim it, and boil for five minutes. Pour it into clean, hot jars, and seal them. The juices may be used in making beverages, jellied desserts, and pudding sauces.

Baked Rhubarb.

Cut the rhubarb into small pieces. In a buttered baking-dish place a layer of rhubarb, sprinkle it generously with sugar, and alternate in this way until the dish is filled. Sprinkle sugar over the top, and add small pieces of butter and grated lemon-rind or cinnamon. Bake the dish slowly until it is well done. Long, slow baking gives rhubarb a rich, red colour.

Rhubarb Puffs with Foaming Sauce.

1 cupful flour.
1 teaspoonful baking-powder.
¼ teaspoonful salt.
¼ cupful sugar.
½ cupful milk.
1 tablespoonful melted butter.
1 egg, beaten.
Rhubarb sauce.

Method.—Combine all the ingredients except the rhubarb in the order given, and beat the mixture until it is smooth. Grease individual moulds or cups, and into each put three tablespoonfuls of rhubarb sauce and then one tablespoonful of the butter. Steam the puffs for twenty minutes, and serve them warm with cream and sugar or with foaming sauce.

Foaming Sauce.

⅔ cupful rhubarb juice.
1 cupful sugar.
Whites of 2 eggs.

Method.—Boil the sugar and juice until the syrup threads. Pour it over the well-beaten whites of the eggs, and beat the mixture until it is smooth and thick. Serve the sauce cold.

Rhubarb Tart.

Roll out plain pastry to ⅛ in. in thickness. Cut it in circular pieces 4 in. in diameter. Place a tablespoonful of rhubarb preserve on each piece. Moisten one-half of the edge with cold water, fold the pastry over, pressing the dry edge on the moistened edge. Prick the tops, and bake the tarts in a hot oven.

Rhubarb Sherbert.

(For those who own a refrigerator.)

1 tablespoonful granulated gelatin.
½ cupful cold water.
4 cups rhubarb juice.
2 cupfuls sugar.
Juice of 2 lemons.

Method.—Soak the gelatin in the cold water until it is soft, and make a syrup by boiling a pan of the rhubarb juice and the sugar for five minutes. Pour the hot syrup over the gelatin, add the lemon juice, and stir the mixture well. Strain it, allow to cool, and freeze it.

Rhubarb Fool.

Milk, ½ pint.
Salt, ⅛ teaspoonful.
Sugar, 2½ oz.
Cornflower, ½ oz.
Eggs, 2.
Vanilla, ½ teaspoon.
Rhubarb.
Cream, ½ cup (whipped).

Method. — Boil the milk, add it gradually to the egg-yolks, which have been beaten with the cornflour, and add the salt and half the sugar. Cook over boiling water till thick. Cool, and combine with the egg-whites beaten stiffly, with the remaining sugar. Add an equal quantity of strained rhubarb pulp and half a cup of cream. Serve cold. NOTE.—In making the custard one egg may be used instead of the two yolks, in which case all the sugar would be added with the cornflour and salt and the extra whites omitted.

Rhubarb and Pineapple Marmalade.

Shred enough pineapple to make a quart, and to it allow 2 quarts of rhubarb cut into small pieces, the grated rind and strained juice of two oranges, and 3½ quarts sugar. Put the shredded pineapple into a preserving-pan with a very small amount of water (just enough to prevent burning). Cook until tender. Add the rhubarb, sugar, rind, and juice and cook until thick. Put into clean jars, and seal.

What Vegetables to Serve.

Beef.

Roast Beef.—Potatoes (boiled, roasted, baked, scalloped, in half shell, sweet potatoes), cauliflower, cabbage, celery, carrots, peas, french or butter beans, broad beans, asparagus, onions, pumpkin, marrow, turnips, small beets, tomatoes, spinach.

Steaks.—Potatoes (same as for roast), also french fried potatoes, potatoes *au gratin*; cucumber, mushrooms, peas, onions, tomatoes, celery, turnips.

Beef Stew.—Potatoes (boiled or riced), turnips, parsnips, carrots, tomatoes, peas, beans, celery, onions.

Baked Heart. — Potatoes (riced, *au gratin*), parsnips, tomatoes, beets.

Tongue.—Potatoes (mashed, creamed, or riced), rice, carrots, beans, spinach, cabbage, tomatoes.

Tripe. — Potatoes (mashed), carrots, celery, onions.

Corned Beef.—Potatoes (mashed), carrots, cabbage, beets, turnips, parsnips, spinach, beet tops, cauliflower.

Veal.

Roast Veal.—Potatoes (boiled, mashed, or browned), rice, spaghetti, macaroni, tomatoes, onions, french and butter beans, spinach, asparagus, turnips (white), all kinds of greens, beets, peas, cabbage, carrots.

Chops or Cutlets.—Potatoes (mashed, *au gratin*, baked), tomatoes, celery, french and butter beans, beet, greens, peas.

Veal Stew.—Potatoes (boiled), rice, carrots, peas, french beans, turnips, parsnips.

Pork.

Roast Pork.—Potatoes (boiled, riced, or mashed), cabbage, tomatoes, spinach, turnips, marrow, pumpkin, onions, parsnips, or apples.

Pork Chops.—Potatoes (boiled, mashed or riced), baked beans or split peas, turnips, beans, spinach, cabbage.

Baked Ham.—Potatoes (mashed, *au gratin*, or scalloped), macaroni, spaghetti, beans, spinach, beets, greens, cauliflower, marrow, pumpkin, onions.

Boiled Ham.—Potatoes (baked, in half shell, creamed, scalloped, and browned), spinach, brussels sprouts, cauliflower, cabbage.

Sausage.—Potatoes (mashed, baked, or potato balls), macaroni, spaghetti, or bananas, tomatoes, apples, cabbage, french or butter beans.

Mutton and Lamb.

Lamb Chops.—Potatoes (baked, scalloped, or stuffed, kumeras), tomatoes, peas, beets, creamed carrots, french and butter beans *au gratin*, asparagus, marrow, and pumpkin.

Boiled Lamb or Mutton.—Potatoes (boiled), rice, beans, turnips (yellow and white), onions, spinach, brussels sprouts, cabbage, carrots, cauliflower.

Roast Lamb.—Potatoes (boiled, mashed, riced, or creamed), rice, artichokes, green peas, beans, tomatoes, marrow, onions, white turnips, asparagus, cauliflower.

Roast Mutton. — Potatoes (boiled, mashed, riced, or creamed), rice, artichokes, asparagus, spinach, beans, green peas.

Fish.

Baked Fish.—Potatoes (scalloped, stuffed, baked), peas, asparagus, cucumber, beans.

Creamed Fish.—Potatoes (mashed, riced, baked), tomatoes, beans.

Steamed Fish.—Potatoes (mashed, balls) tomatoes, beans, peas.

DEPARTMENT OF AGRICULTURE.

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WELLINGTON.

Recommended Recipes.

Beef Meat Patties.

Chuck steak, brisket, topside, shin, balde, bolar, flank, and trimmings, thick and thin skirt. Any of these steaks might be used successfully. The leaner cuts are improved by the addition of suet (finely chopped), but with brisket and other fat cuts care must be taken that the fat is used in correct amounts.

Method.—Mince meat on medium grinding-knife of machine. If too fine, a heavy, compact pattie will result, while a coarse product gives a tough pattie, because the connective tissue has not been ground up sufficiently. Bacon may be used to surround if desired.

Methods of Cooking.—(1) Under griller; (2) in hot frying-pan—no additional fat added—seared at high temperature and then cooked slowly. Time, eight to ten minutes for medium-sized pattie; (3) baked, temperature 450° F. Time, eight to ten minutes. N.B.—The patties must not be overcooked or they will be hard and tough. Also, care must be taken in moulding, as a closely packed pattie is hard and uninteresting. The addition of fine breadcrumbs (bread twenty-four hours old) improves the texture.

Meat Patties on Onion Rings.

Lean beef (minced), 2 cups.
Suet (chopped), ¼ cup.
Breadcrumbs, 1 cup.
Bacon strips, 7.
Water, 1 tablespoon.
Onion slices, 7.
Onion-juice.
Parsley (chopped), 1 tablespoon.
Dripping, 3 tablespoons.
Salt, ½ teaspoon.
Pepper, ⅛ teaspoon.

Method.—Lay the slices of onion in a greased baking-dish. Pour over them the melted fat, sprinkle with salt and pepper, add the water, cover closely, and bake in a moderate oven (350° F.) for thirty minutes or until tender. In the meantime combine the other ingredients, mix thoroughly, and mould into seven flat cakes and surround each with a strip of bacon. Place cakes on the onion slices in the pan and grill under direct heat for five minutes on each side or bake in oven of 450° F. eight to ten minutes. Serve from meat platter with stuffed tomatoes, sautéd bananas, or baked kumeras.

Stuffed Tomatoes.

Tomatoes, 6.
Bacon or ham (cooked), 1½ oz.
Butter or other fat, 1 tablespoon.
Parsley, 1 teaspoon.
Nutmeg, ½ teaspoon.
Breadcrumbs, 2 tablespoons.
Grated cheese, 1 teaspoon.
Salt, ½ teaspoon.
Pepper.
Onion (chopped), ½.

Method.—Cut stem ends from tomatoes and remove insides. Cook onion in the fat for a few minutes and add chopped bacon, parsely, nutmeg, breadcrumbs, pepper and salt, and tomato pulp. Fill tomato cups with this, letting mixture come above the top. Bake in oven, at 350° F., ten to fifteen minutes, and serve.

Braised Meat.

Meat, 2 lb.
Carrot, 1.
Turnip, 1.
Onion, 1.
Celery, 1 stick.
Fat, 2 tablespoons.
Lean bacon or ham, ½ oz.
Peppercorns, ½ teaspoon
Mace, 1 blade
Bunch herbs } tied in muslin.
Salt.
Stock or water.

Method.—Melt the fat in a stew-pan and sauté the bacon (cut in dice) and the sliced vegetables. When slightly browned pour off any surplus fat, add just sufficient stock barely to cover vegetables. Add the herbs and seasonings and bring to the boil. The meat may be prepared as desired—by boning, stuffing, &c. Weigh, and allow for cooking thirty to forty minutes to the pound and thirty to forty minutes over. The meat after browning in fat is placed on top of the vegetables in the stew-pan. The lid should fit very closely and the cooking temperature be 185° F. (simmering-point). Baste occasionally and serve on a meat ashet with the vegetables and gravy arranged around the joint.

Pan Broiled Steak.

Undercut or rump steak cut ¾ in. to 1 in. thick.
Salt.
Pepper.
Butter.
Parsley.

Method.—Wipe the meat with a damp cloth and trim the fat, being careful to leave some adhering to the meat. Have the frying-pan very hot. Put the meat in, and, as soon as one side is seared, turn to sear the other side. (Use a knife with blunt point or a spatula, never a fork.) Turn frequently for the first minute, then reduce temperature and cook slowly until cooked. Medium-sized steak will cook in eight to ten minutes medium rate, while larger steak should be cooked twelve to fifteen minutes, according to individual preference. Serve piping hot with parsley, butter, and sautéd bananas.

Pot Roast of Beef.

Cuts of beef suitable are rib roasts, sirloin, brisket, clod, rump, and topside. Select a piece 4 lb. to 6 lb. in weight. Wipe with a damp cloth. Rub meat with salt, pepper, and flour. Brown the meat on all sides in a heavy saucepan, using about three tablespoons of beef fat. Slip a low rack under the meat, add one-half cup water, cover tightly and simmer until tender. The time required for cooking cannot be definitely stated, but it will probably be about three hours. Turn roast occasionally, and when meat is cooked remove from pot, skim off the excess fat from the liquid, and measure the remainder. For each cup of gravy desired use 2 tablespoons of fat and return to the pot, add one and a half to two tablespoons flour, and stir until well blended and slightly browned. Then add one cup of meat stock or cold water and stir until smooth. Season the gravy with salt, pepper, and chopped parsley. Serve on a hot ashet with buttered carrots and stuffed onions. If desired, any of the following may be cooked in pot with the roast: Carrots, celery, onions, potatoes, tomatoes, and turnips.

Founders of Modern Agriculture, No. 12.

J. W. Woodcock, Crop Experimentalist, Fields Division

Sir John Lawes.

SIR JOHN BENNET LAWES (1814–1900) can be classed among the outstanding figures in history, and modern agriculture is much indebted to this man, who devoted his life and his fortune to agricultural science.

Born at the Manor-house at Rothamsted, which is now the world-famous Research Station, Lawes inherited his father's estate at the age of eight. After his education at Eton and Oxford he specialized in chemistry in London and became associated with J. H. Gilbert, with whom he collaborated in most of his later work. In 1834 he retired to his estate at Rothamsted and began to experiment on plants growing in pots, the investigations being subsequently extended to the field.

Invention of Superphosphate.

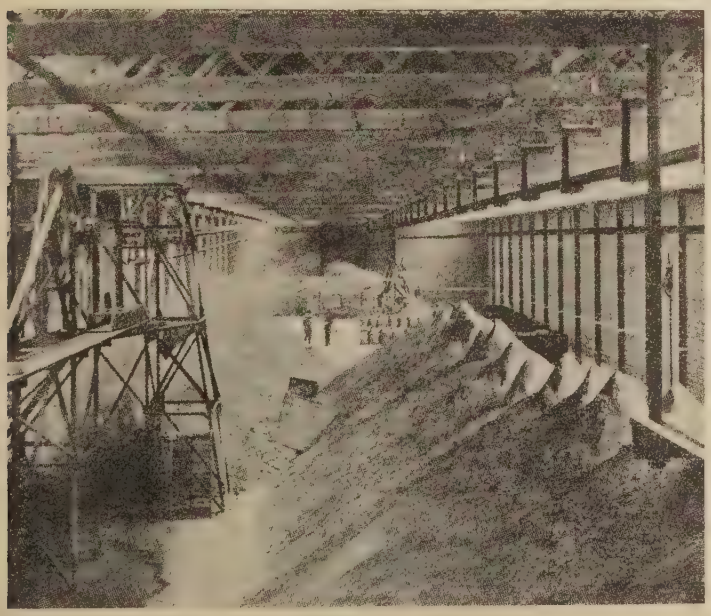
One of the most striking results observed by Lawes was the excellent effect produced upon the turnip crop by dressing it with mineral phosphates that had been treated with sulphuric acid. At once grasping the importance of this discovery, he obtained in 1842 a patent for the manufacture of superphosphate, and thus laid the foundation of a great industry.

Rothamsted Experimental Station.

In 1843 Lawes founded a properly equipped agricultural experiment station at Rothamsted, which has since become world-famous, and in this enterprise he enlisted the co-operation of his former fellow-student, Dr. (later Sir) Henry Gilbert. The experiments carried out by Lawes and Gilbert were conducted on the same general lines as those begun earlier by Boussingault, but with the advantage that they have been continued year after year on the same ground without alteration except in occasional details.

The field trials settled many points about which only hazy ideas had been prevalent formerly. Many of the truths that Lawes discovered have now become incorporated with the stock of common knowledge, and have benefited the agricultural practice of all progressive countries.

Sir John Lawes, Bart., F.R.S.



The manufacture of superphosphate. The method was invented by Sir John Lawes.

Soil and Animal Research.

Out of the mass of vague ideas regarding soil, plant, and animal, the work at Rothamsted Experimental Station proceeded to obtain some semblance of order. The necessary finance and direction was supplied by Lawes, who, fortunately, was able to utilize the proceeds from his superphosphate invention for the purpose.

The main outcome of the research was the discovery that soil fertility could be maintained by means of artificial fertilizers, although farmers were slow to believe that chemical manures could ever do more than stimulate the crop and must eventually exhaust the ground. In addition to work on soil and plants, investigations carried out on farm animals added greatly to the existing knowledge of factors, such as animal growth and food consumption.

In 1882 Lawes was created a baronet, and many other honours were bestowed on him indicative of public appreciation of the great work which he had voluntarily undertaken. Rothamsted and its valuable work still remains a famous memorial to one of the greatest founders of modern agriculture.

New Zealand's Future.

Contributed by the Department of Industries and Commerce.

A MAGNIFICENT future lies ahead of this young country, a future which depends on intense and concentrated effort by all to develop to the utmost every activity of which it is capable. So far the primary-producing industries have occupied the most important position in New Zealand's economy, and, while they are still far from full development, it is in the interests of the Dominion as a whole that more attention should be paid to the manufacturing industries.

Both the rural and industrial resources of New Zealand should be exploited at the same time. The result of such a policy would be a greater turnover on the internal market—the most valuable market any country can have—to the benefit of all sections and classes. While efficient farming and its products are the foundation of New Zealand trade, the tendency towards restrictions on the markets for export produce, and the policy of economic nationalism being pursued by most countries of the world, make it imperative that New Zealand should give more attention to her manufacturing industries.

The extension of local industries, both primary and manufacturing, is essential to enable us to absorb the greater population necessary for the development and protection of this country. All these industries are interrelated, the extension of manufactures providing a greater local market for the farmer, and the development of farming providing a bigger outlet for manufactures.

The happiness of thousands of New Zealand homes depends on the success and prosperity of individual manufacturing plants. The activity of those manufacturing plants depends upon the public demand. If the public give full consideration to local products when making their purchases, the factories will be busy and the homes depending on those factories will be well supported. We can also render a real service not only to our workpeople, but also to trade as a whole, if we insist—and we can insist with confidence—on preferring New-Zealand-made commodities where they are available. And New Zealand goods are available equal in value and quality to the finest imported lines. There are but few industries which are not being developed in New Zealand. In the manufacture of food, clothing, vehicles, household articles and furniture, machinery and technical equipment, there are industries flourishing and producing goods which compare favourably with those made in any other part of the world.

Every order for goods made by the New Zealand workers beneficially affects an extraordinarily wide range of workers in the Dominion. When these industrial orders are multiplied by the numbers of consumers in the Dominion, factories operate at full capacity, skilled artisans are busy, and money flows freely within the country. It is not the manufacturer only who benefits. The wave of prosperity which follows spreads in all directions. The aim of all production is consumption, and therefore it follows that if we wish to increase production in New Zealand we must consume New-Zealand-made goods.

Tour of Australia.

A COMPREHENSIVE tour of New South Wales and Victoria has been planned by the Victorian Railway Commissioners in conjunction with the New Zealand Tourist Department. Extensive excursions have been arranged into the rural districts of those States, and this feature of the itinerary will doubtless appeal to many New Zealand farmers.

The itinerary is as follows :—

1939.
April 13 Afternoon : Depart Wellington per m.v. "Wanganella."
" 14–16 At sea.
" 17 Morning : Arrive Sydney—transfer to hotel.
Afternoon : Motor tour of Sydney, Harbour Bridge, and surfing beaches.
8.50 p.m. : Depart on "Limited" Express (sleeping-berths).
" 18 7.30 a.m. : Arrive Albury—transfer to Victorian Reso train.
Morning : Inspect Albury and visit Hume Reservoir.
Afternoon : Rutherglen and Corowa, inspecting wine-cellars and station properties.
" 19 Mount Buffalo National Park.
" 20 Shepparton : Inspect fruit cannery, orchards, and irrigation area.
" 21 Yallourn : Inspect open cut at Brown Coal-mine ; also the electric-power house and briquetting-works.
Warragul : Visit dairy-farms and surrounding areas.
" 22 Melbourne : Morning at leisure.
Afternoon : Motor tour of city and residential suburbs.
" 23 Melbourne : Morning at leisure to visit Botanic Gardens and Shrine of Remembrance and other features.
Afternoon : Motor tour of the Dandenong Ranges, as guests of Brotherhood of Resonians.
" 24 Mount Gambier : Inspect Corriedale sheep, Shorthorn and Hereford cattle. Visit Blue Lake and limestone quarries.
" 25 Portland : Free—attend Anzac Day Celebrations.
" 26 Warrnambool : Inspect dairying industries, potato and onion land.
April 27 Colac : Inspect butter and cheese factory, surrounding dairying areas and sheep properties.
" 28 Morning : Ballarat, Visit Sir Alan Currie's homestead "Ercildoune" and surrounding district.
Afternoon : Great Western. Inspect Great Western Sparkling Wine Cellars and Vineyard.
" 29 Mildura : Inspect irrigation area, vineyards, and packing-sheds.
" 30 Mildura : Whole day steamer tour on the River Murray.
May 1 Melbourne : Arrive in the morning. At leisure.
6.30 p.m. : Depart for Albury on "Spirit of Progress."
10.20 p.m. : Arrive Albury—transfer to New South Wales train.
10.40 p.m. : Depart Albury (sleeping-berths).
" 2 8.55 a.m. : Arrive Sydney. At leisure.
" 3–4 Two-day tour to the Blue Mountains and Jenolan Caves—two of the outstanding scenic attractions of New South Wales.
" 5 4 p.m. : Depart Sydney on m.v. "Wanganella."
" 6–8 At sea.
" 9 Morning : Arrive Wellington.

The inclusive cost of the tour is £75. This covers ordinary first-class steamer fare from and to Wellington (cabin premiums excepted), all rail travel, sleeping-berths, meals, and transport from arrival in Sydney to departure from Sydney. While in Victoria (except on the return journey from Melbourne to Albury, when the journey will be made on "Spirit of Progress") the party will travel on the Reso train, which consists of a lounge-observation car, sleeping-cars, dining-car, and two other cars containing hot and cold shower-baths.

For all further information inquire at any branch of the New Zealand Government Tourist Bureau, or any Travel Agency.—P.B.A.

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